

FLIGHT

The
AIRCRAFT ENGINEER
AND AIRSHIPS

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Founder and Editor : STANLEY SPOONER

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EDITORIAL COMMENT



GREAT shock was recently given to aeronautical circles in Australia, when it was rumoured that the new Labour Government intended to abolish the Royal Australian Air Force, and substitute an army air arm and a naval air arm. Such a change could not be effected without an Act of Parliament, as an Act establishing the R.A.A.F. is on the statute books of the Commonwealth. The ground for making such a change would, of course, be a hope of effecting economies, though it is very doubtful whether the result would justify the step. At any rate, it may be taken as certain that if the change had been effected, the Australian taxpayer would have received much less value—in the shape of defence—for his money than is the case under the present system.

The Royal Australian Air Force

Fortunately, it seems extremely unlikely that the suggestion will be put into effect. A special committee considered the question, and reported against the proposed change. As this committee included not only the Chief of the Australian Air Staff, Group-Captain Williams, but also the first member of the Naval board, Rear-admiral W. M. Kerr, and the chief of the general staff of the military forces, Lieut.-General Sir Harry Chauvel, its report must naturally carry great weight, and, it is hoped, will result in the suggestion being permanently pigeon-holed.

In truth, it may be doubted if the suggestion was every made in all seriousness. The Labour Government of the Commonwealth, though desirous of economy, is very patriotic, and has no desire to reduce the effectiveness of the defence forces of the country. One may quote the words of some of the leaders, as reported in the *Melbourne Argus*. Speaking at Sydney last October, Mr. Charlton said " Australia needs shore guns within range of which no enemy vessel will appear, and an aerial fleet that cannot be outnumbered . . . Such methods are not only within our resources : they are equal to our necessities." A few days later Mr. Anstey, now

DIARY OF CURRENT AND FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in this list—

1930	
Jan. 22	.... "The Strategical Mobility of Air Forces," Lecture, by Gp.-Capt. C. L. Courtney, before Royal United Service Inst.
Jan. 22	.... Rugby Football. R.A.F. v. Cambridge University, at Cambridge.
Jan. 23	.... "Certificates of Airworthiness," by Mr. H. B. Howard, before R.Ae.S. and Inst.Ae.E.
Jan. 25	.... Rugby Football. R.A.F. v. Northampton, at Northampton.
Jan. 30	.... Rugby Football. R.A.F. v. Leicester, at Leicester.
Feb. 5	.... Banquet, Royal Aero Club. in conjunction with R.Ae.Soc., Air League of the British Empire, and Soc. Brit. Aircraft Constructors, at Savoy Hotel.
Feb. 7	.... British Empire League Luncheon to Lord Thomson, at British Empire Club, 12, St. James's Square.
Mar. 5	.... "Air Co-Operation with Mechanised Forces," Lecture, by Wing-Com. T. L. Leigh-Mallory, before Royal United Service Inst.
June 28	.... Royal Air Force Display, Hendon.
Sept. 6-28	.... Aero Exhibition, Stockholm, Sweden.
Nov.	.... Paris Aero Show

Minister for Health, said at Brunswick "The Labour Party stands for the defence of Australia against any foreign interloper. It stands for an air fleet, not a sea fleet." One need not make too much of the obvious fact that Mr. Charlton is no tactician, and that powerful shore guns would be one of the least efficient means of defending the enormously long coast line of Australia. He would be a very foolish invader who, with such an almost infinite choice of landing places before him, chose the very spot where the big guns were emplaced. The point of both speeches is that the two leaders have grasped the fact that aircraft are Australia's best defence.

The subject is worthy of further consideration. The data are that Australia has, as mentioned above, an enormous coastline and a small white population. On most sides the coasts are bounded by wide oceans the Indian and the Pacific. The East Indian Islands make stepping stones to Asia; that is, to Singapore. But Singapore is not yet in full working order, and Australian defence strategists must not take it too closely into account. The problem is very different from that of the air defence of Great Britain, with its narrow seas. One cannot argue that what is right in the one case is necessarily right in the other.

With a small population the revenue must also needs be small. The greatest care must be exercised to see that for the comparatively small sum which Australia is able to spend on defence, the very greatest measure of defence is obtained. At the same time, an essential of any scheme of defence is that the force used should be excessively mobile. In both respects the Air Force, and only the Air Force, fills the bill. One can understand the Labour Party questioning whether the great cost of a very small navy is really worthy while. For sea defence, Australia must depend mainly on the Royal Navy. We do not propose here to enter into the complex question of the best way for a Dominion to contribute to the strength of the Royal Navy. That does not come within the province of an aeronautical paper. It does seem to us that, in the special circumstances of Australia, aircraft carriers can be, and should be, regarded as a part of air defence rather than of naval defence; for if aircraft are to be used to strike at the invader's ships, it is obviously better that they should engage them at a distance from the coast rather than after a landing has been effected. For such a purpose, it does not seem that a naval escort for the carriers is quite indispensable.

It does seem clear, therefore, that the one striking force which can be bought with a moderate sum of money, and which can at the same time prove a real embarrassment to an invader, is an air force. It behoves Australia to see that its air force is as good and as numerous as the available resources permit.

It may be said that all this does not prove that the air force must be a separate service, and that it still remains an open question whether the aircraft should not be divided between the army and the navy. It may be said of the Australian army, as it is justly said of the Home army, that if it ever comes into action it will need an air arm, while the Royal Australian Navy, if the new Government continues to support it at all, must needs work with the marine aircraft in keeping the invader at a distance from the coasts. The point is that the only hope of effective defence for Australia lies in air action, and air action should dominate all schemes of defence. Whether it is a question of striking at

approaching transports and their escort, or of localising the effects of a landing and harassing the party which has landed, it is only aircraft which has the requisite mobility and striking power. As, in any case, the defence force must be small, it is doubly necessary that it should not be dissipated. Given a few months for training, the Australian army would doubtless become as fine a fighting force as it was in Gallipoli and France. But while it was training, the responsibility for defence would lie in the hands of the Chief of the Air Staff. He it would be who would concentrate his flying-boats, his torpedo-planes, and his bombers at the best points for striking at the foe, and, if his dispositions were skilful, he might well defeat the enemy before the army was ready to come into action. For, if his sea communications were cut, the invader would *ipso facto* be defeated. The action of seaplanes and landplanes would have to be combined by one commander, who knew the functions of both, and who had studied and practised combined and successive action by the two types.

Such combined training would be impossible if the Royal Australian Air Force were to be split up into an army arm and a naval arm. In Great Britain it may in time become necessary to review the army and the navy detail arrangements for utilising aircraft to the best advantage, while the Royal Air Force specially looks after air defence. But the case of Australia is different, and there it would seem to be a disastrous step to alter the present position of the Royal Air Force. That force should be fostered and improved, along the lines laid down by Air Chief Marshal Sir John Salmond. When the programme which he drew up has been completed, Australia will be able to feel a considerable measure of confidence in her ability to make things extremely unpleasant for any enemy who dares to threaten the integrity of her shores.



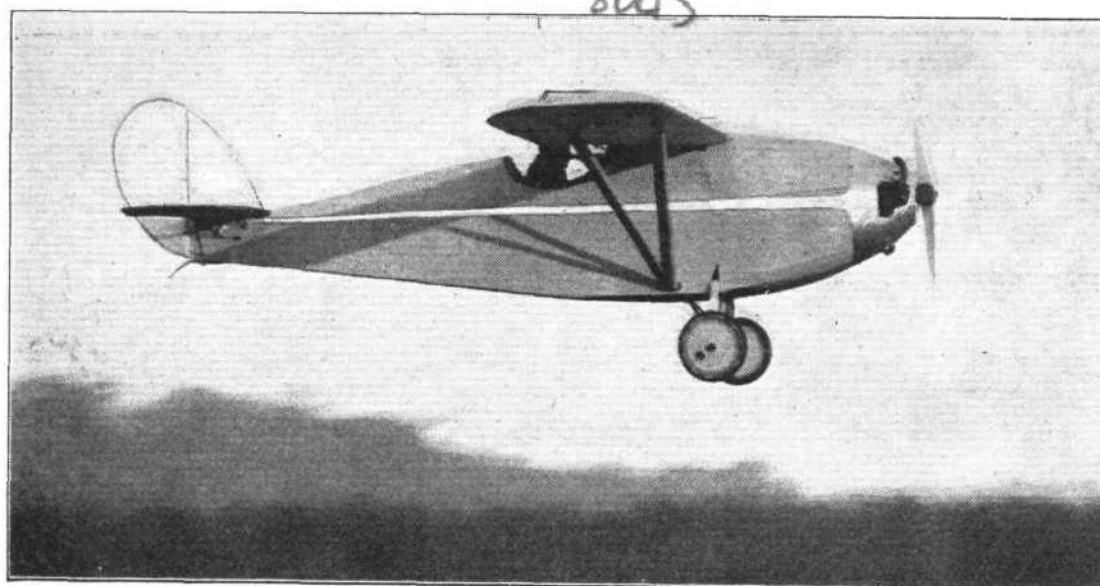
In view of the fact that a movement is now on foot to revive the interest in gliding in this country, a word of warning may not be out of place. While we would not wish to pour cold water on the scheme

in any way, we think those responsible should bear in mind that gliding came to an abrupt stop in 1922, as soon as Maneyrol had established a record by remaining aloft for 3 hours 21 minutes 7 seconds.

There was a time when it was thought that much valuable aerodynamic knowledge might be accumulated cheaply by means of gliding experiments. That view is probably not very well founded. The difficulty of accurately measuring the airspeed at any given moment almost precludes accurate measurements.

Then there was the theory that gliding was a cheap and effective way of training pilots. Cheap it certainly is. Effective probably not. We believe we are right in saying that in Germany it has been found that pilots trained on gliders were not, generally speaking, especially good material for pilots of power-driven machines.

What, then, it may be asked, is the function of gliding? We think the answer must be "Sport." Gliding is excellent fun. The week at Itford in 1922 was the most enjoyable we remember. But that is all one should expect from it, and it should be more than enough.



THE COMPER "SWIFT"

A Fast Single-Seater with A.B.C. "Scorpion" Engine

DESIGNED as a low-powered, low-priced single-seater, with a performance equal to that of the modern two-seater light 'plane, the Comper "Swift" is the first machine to be produced by F/Lt. Nicholas Comper since he left the R.A.F. and formed The Comper Aircraft Co., Ltd. That is not to say, however, that the "Swift" is the work of a beginner. Far from it. Before joining the R.A.F. several years ago, Mr. Comper was in the drawing office of the Aircraft Manufacturing Company, and after joining the service he designed, it will be remembered, the series of Cranwell machines, C.L.A. 1, C.L.A. 2, C.L.A. 3, and C.L.A. 4, for the Cranwell Light Aeroplane Club. These machines all showed originality coupled with common sense, and Mr. Comper is one of the few designers who has for many years held the belief that high power is not necessarily required in order to get a good performance out of a light 'plane.

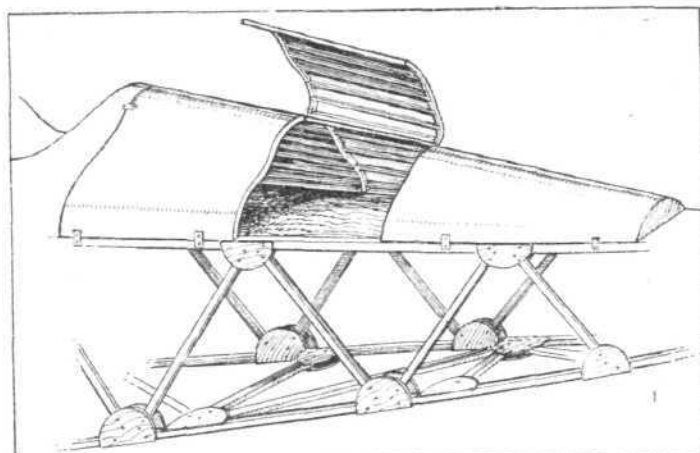
The C.L.A. 2 was a side-by-side two-seater with Bristol "Cherub" engine, and at the Lympne Light 'Plane Meeting of 1924 this machine piled up, during the meeting, just under 18 hours' flying and a mileage of 762.5 miles, thereby winning the £300 Reliability prize offered by the S.M.M.T. for the greatest number of completed laps of the Lympne course.

The C.L.A. 3 was quite a different type of machine, being a parasol single-seater monoplane with Bristol "Cherub" engine. That machine made its first public appearance at the Lympne race meeting of August, 1925, when it won the International Scratch Speed Race for light aeroplanes, and was favourably commented upon for its high speed and good manoeuvrability.

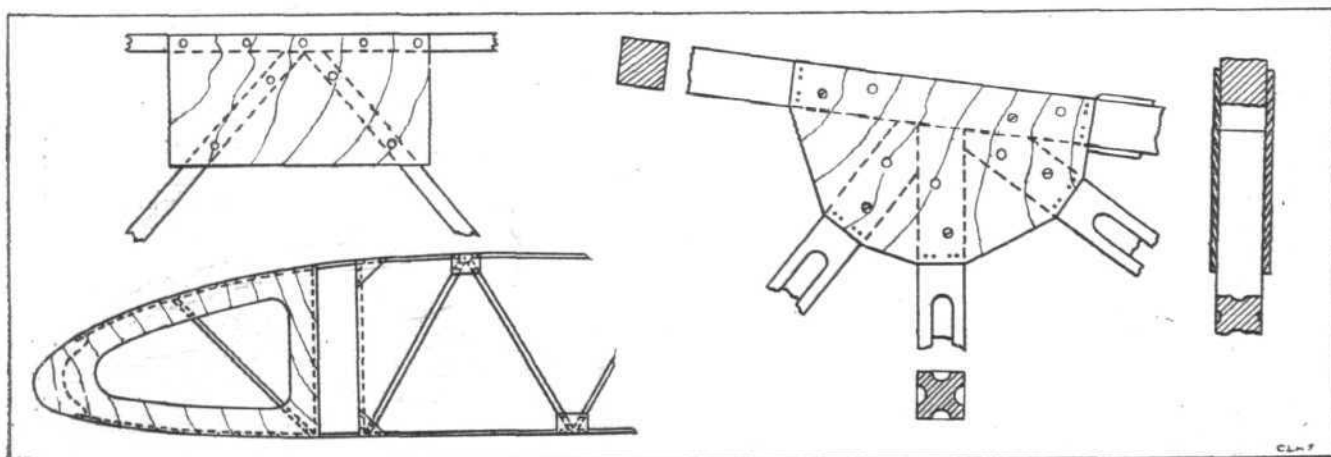
Finally, it may be recalled that the C.L.A. 4 was designed and built for the *Daily Mail* two-seater light 'plane competition held at Lympne in 1926. The design of this machine was based upon the Pobjoy engine, but as that engine did not manage to pass its tests for the Air Ministry C. of A. in time, a Bristol "Cherub" of much lower power was fitted.

Although this naturally detracted from the performance, the C.L.A. 4 was still a very nice little machine, and had a very good performance for the power of the engine. Its most unusual feature was that, although a *sesquiplane*, its top wing was smaller in span and chord than the lower wing.

Of previous Comper designs, the C.L.A. 3 was that which the new "Swift" most closely resembles, and from which it may, in fact, be said to have been evolved. That the "Swift" represents a very considerable improvement on the C.L.A. 3 is hardly to be doubted, and this improvement is not confined to performance only, *i.e.*, speed, climb, etc.

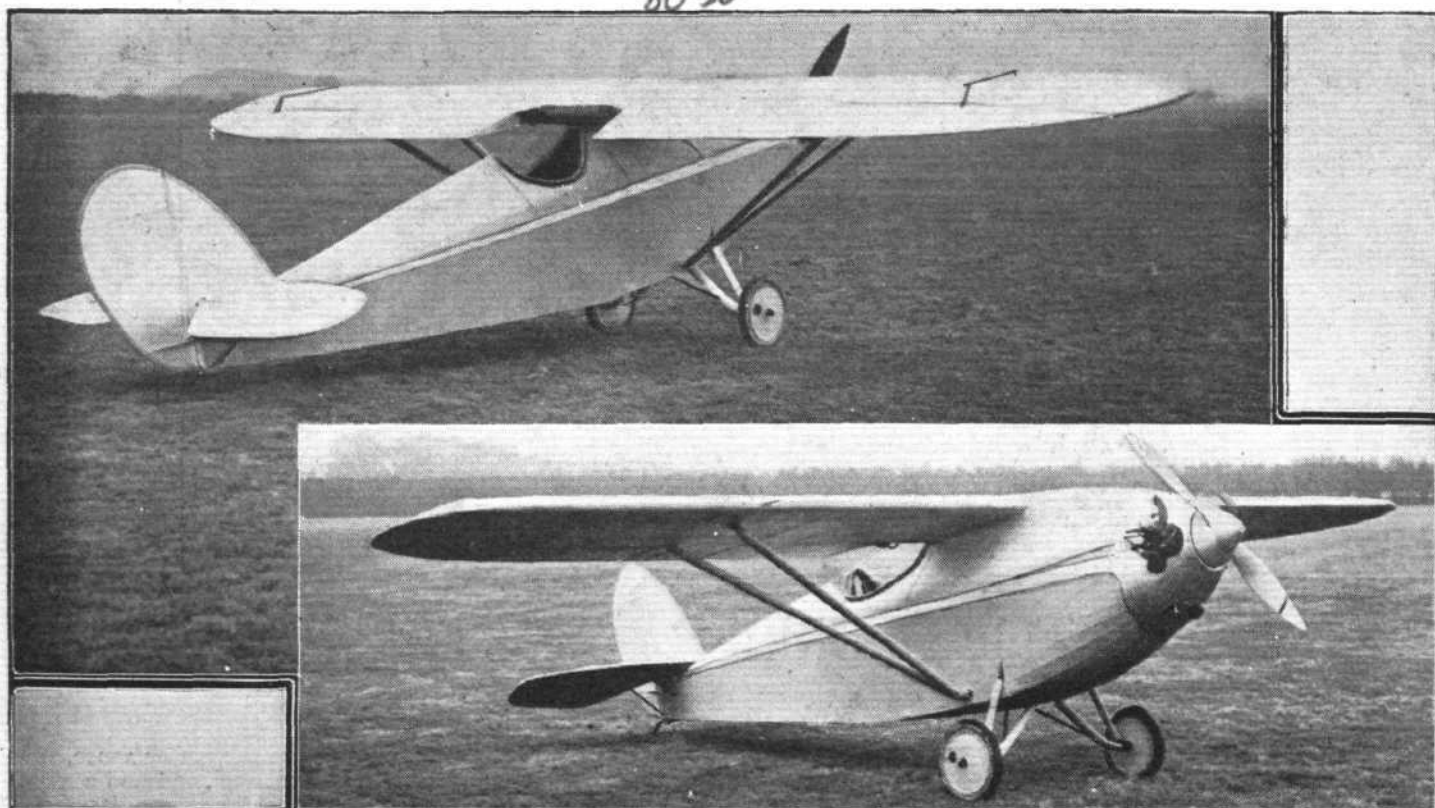


The deck fairing is detachable so as to facilitate fuselage inspection, and contains a luggage locker. (FLIGHT Sketch.)



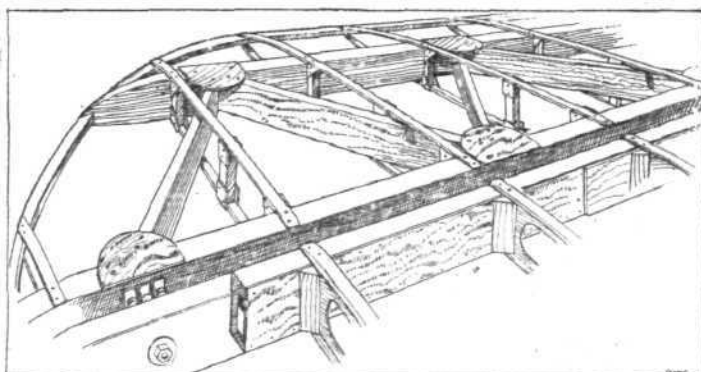
The Comper "Swift": On the left, details of rib construction. The nose ribs are covered with plywood up to the front spar. On the right, a typical fuselage joint. (FLIGHT Sketches.)

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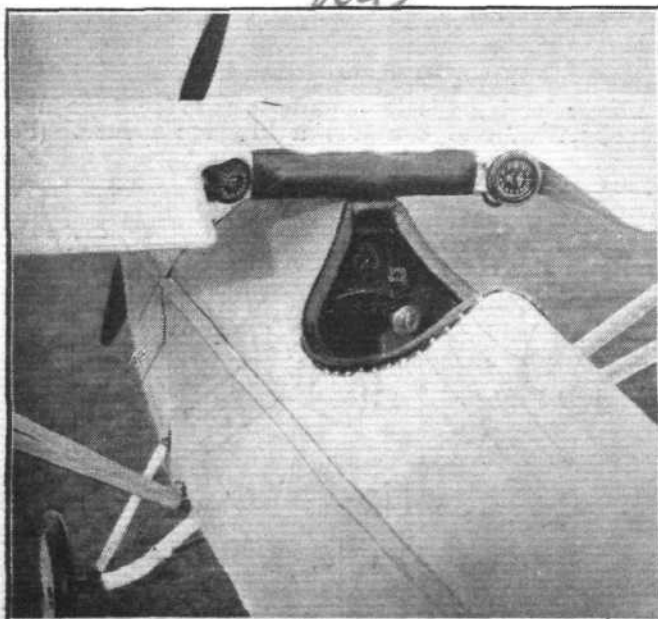
The Comper "Swift" is an extremely neat little machine, and with an engine of 40 h.p. has as good a performance as the more powerful two-seater light 'planes. (FLIGHT Photos.)

but also includes controllability, comfort for the pilot, and generally better appearance. Concerning the last-mentioned feature, the "Swift" is one of those machines which one comes across occasionally, which do not look especially "pretty" in the 3-view general arrangement drawings, but which are found to have very good lines when seen "in the flesh." The photographs which accompany this article bring out this point rather well. For example, the side elevation of the general arrangement drawings show a fuselage which is very deep in front, and which might be expected to cause the machine to look somewhat heavy and "fat." Yet when one looks at the photographs, and even more when the actual machine is inspected, the appearance is one of slimness and, it might almost be said, daintiness. In other words, such a machine as any private owner might be proud of, and "pride of ownership" is not a quality which the designer of light 'planes for private owners can afford, nowadays, to disregard. The Comper "Swift" starts life



Details of the tail plane and elevator construction. (FLIGHT Sketch.)

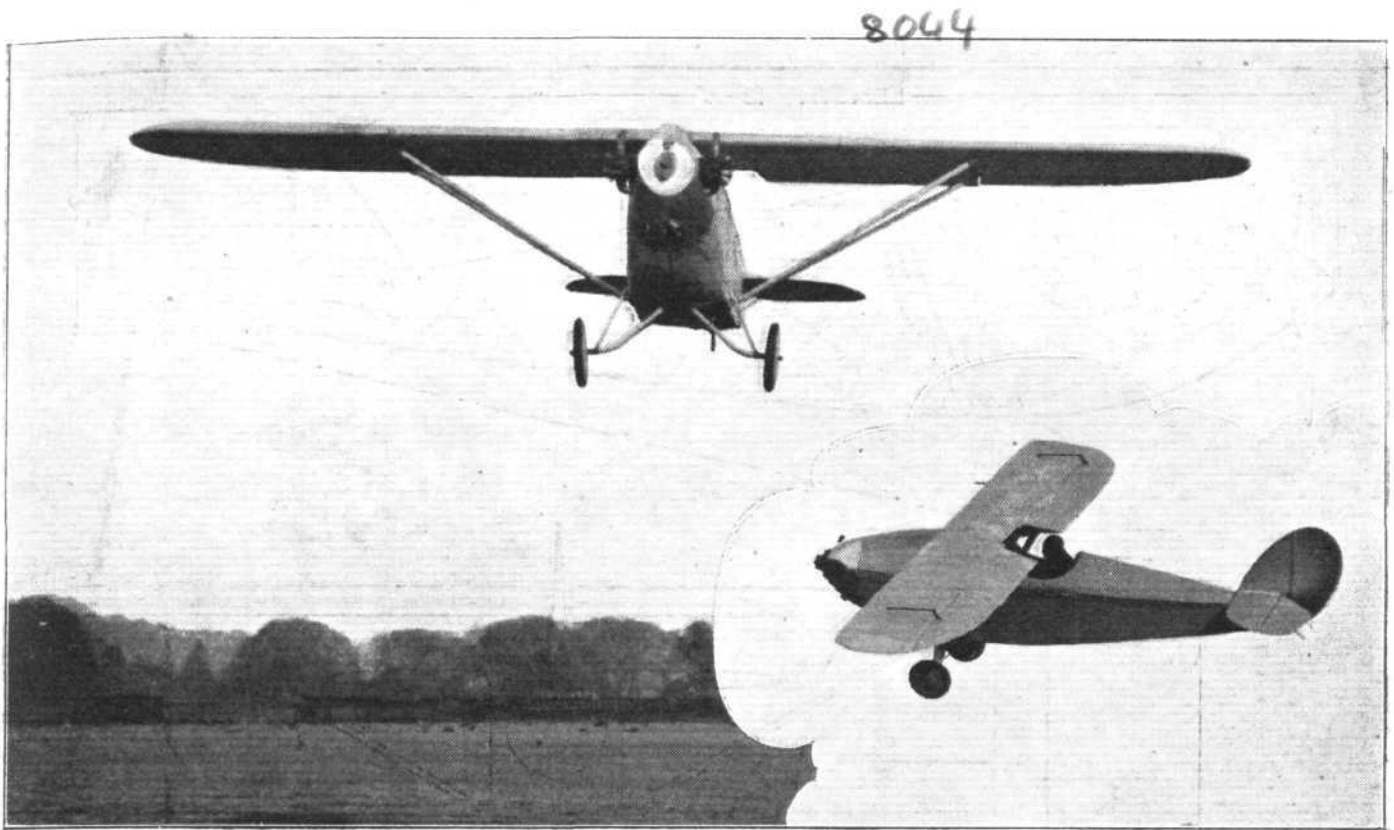
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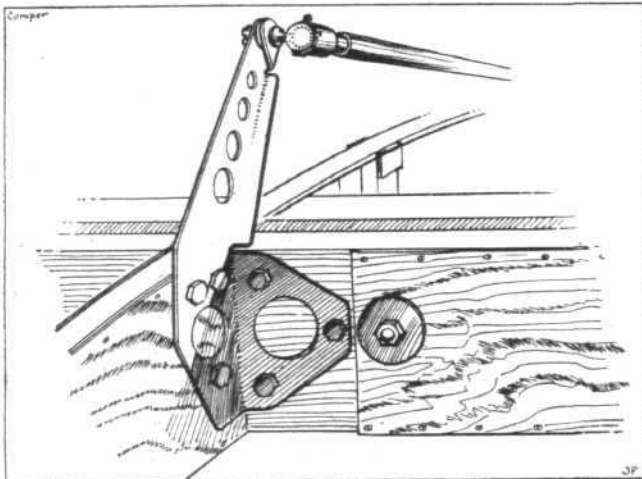
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THE COMPER "SWIFT": On the left a view into the cockpit. On the right the mounting of the A.B.C. "Scorpion" engine, with the cowling removed. (FLIGHT Photos.)



IN FLIGHT: The larger photograph gives a good idea of the clean lines of the "Swift," while the smaller inset illustrates the good view. (FLIGHT Photos.)



The aileron crank and its operating rod. (FLIGHT Sketch.)

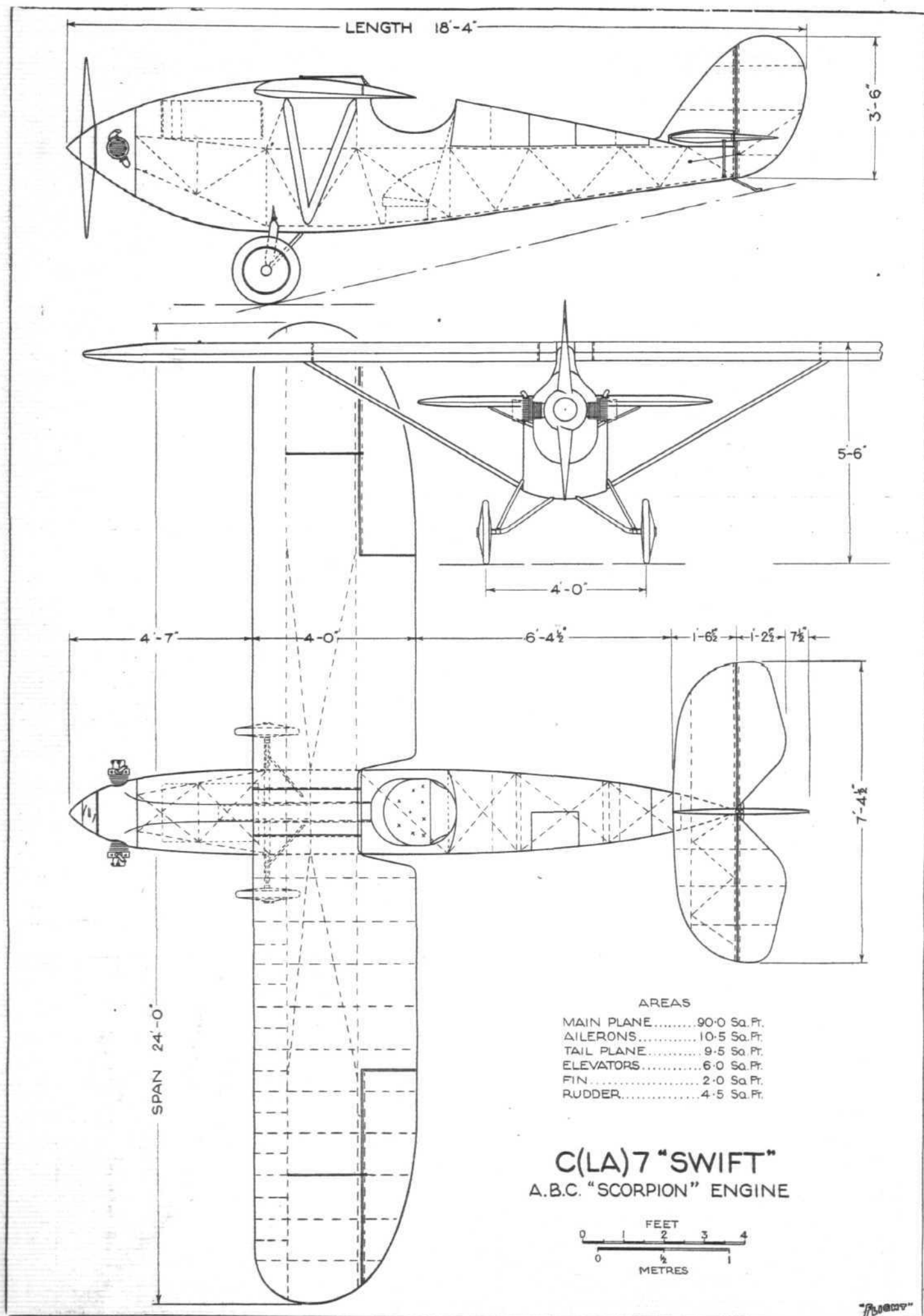
well, in that it has a very distinctive appearance and extremely pleasing lines.

Nothing is so likely to make a pilot dissatisfied with his mount as a poor view. For each "blind spot" in a machine, the pilot is apt to lose a certain amount of confidence, and many an otherwise excellent machine has failed to become popular merely on this count. Knowing this, F./Lt. Comper set himself the task from the beginning, in designing the "Swift," to produce a machine with the best possible view. In a single-seater using a very light engine this is not easy of accomplishment. If the wing is to be on a level with the pilot's eyes, as it should be to get view upward and forward, it means placing the pilot aft of the wing and not under it. To counteract the rearward placing of the pilot's weight, the engine must, being quite light, be pushed forward of the wing a considerable distance, and this results in a fair amount of vertical surface ahead of the centre of gravity. To bring the centre of vertical area aft of the c.g., fairly large tail areas (i.e., fin and rudder) are required, and it will be observed that in the "Swift" these two organs are large in proportion to the small size of the machine.

When examining the "Swift" with a view to assessing the value of its aerodynamic design, one is impressed by the

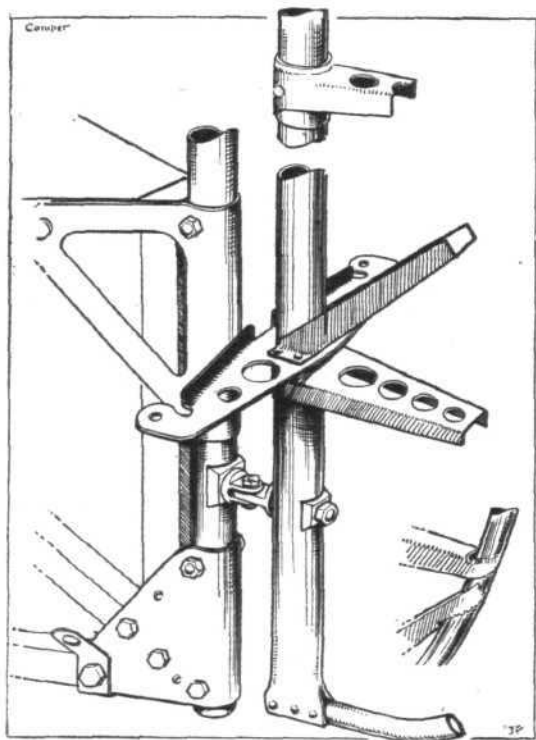


SIDE VIEW OF THE COMPER "SWIFT": Mr. Dawson, Junior, standing by the nose of the machine, gives a good idea of its small size. (FLIGHT Photo.)



THE COMPER "SWIFT" : General arrangement drawings to scale.

cleanness of its lines. The fuselage, no wider than strictly necessary, is deep but of almost perfect streamline form except for the coaming of the cockpit. The monoplane wing rests on but a narrow portion of fuselage, and so the portion of wing rendered inefficient in the centre is a very small proportion of the wing area. A single pair of vee struts on each side brace the wing, and the undercarriage is partly housed inside the fuselage, at least the shock absorber portion. The tail is almost pure cantilever, with but a single short



Stern post, rudder post, etc. (in metal), of the Comper "Swift." (FLIGHT Sketch.)

stabilising strut on each side. Altogether the aerodynamic design strikes one as having been very carefully thought out.

Structurally the "Swift" has a great deal of family resemblance with previous Comper designs, the fuselage being a light fabric-covered girder composed of longerons and diagonal struts attached to the longerons with three-ply wood gussets. This construction is light for its strength, and does not require any trueing-up after prolonged use. The fuselage is actually built in three separate units, the front portion carrying the engine mounting, the cockpit portion, and the tail-carrying portion.

The wing is of equally simple construction, with two spindled-out spruce spars and light girder ribs. The wing is in three sections, of which the very narrow centre-section is built as an integral part of the fuselage, on two of the bulkheads of which it rests. The wings are designed to fold, so that the machine, in itself quite diminutive, will occupy a very small space indeed when folded. The wing covering is fabric. All wing fittings are of simple steel plate type.

The undercarriage is somewhat unusual, and its arrangement may best be understood by reference to the accompanying sketch. The axles are bent, and the wheels located in a fore and aft direction by rearward-sloping radius rods. The "legs" run to internal members carrying the shock absorbers, which are housed entirely inside the fuselage and thus offer no extra drag. While appreciating F./Lt. Comper's desire to cut down drag, we think we should have preferred to take the undercarriage "legs" up to the vicinity of the top longerons. This would add a little exposed strut length, but should make for greater stability on the ground.

The cockpit is very comfortable, and the instruments have been arranged in a manner which facilitates reading of those most frequently required, and which are not "mixed up" with those that only need an occasional glance. The altimeter is mounted on the back of the rear spar, on the port side, and the airspeed indicator in a similar position on the starboard side. The other instruments are mounted on a dash inside the cockpit.

The petrol is carried in a gravity tank with a capacity of 9 gallons, located in the deck fairing aft of the engine. Actually the tank has a partition which separates one gallon out of the nine from the main supply. Thus when the bulk of the petrol is used up, the pilot turns on the reserve

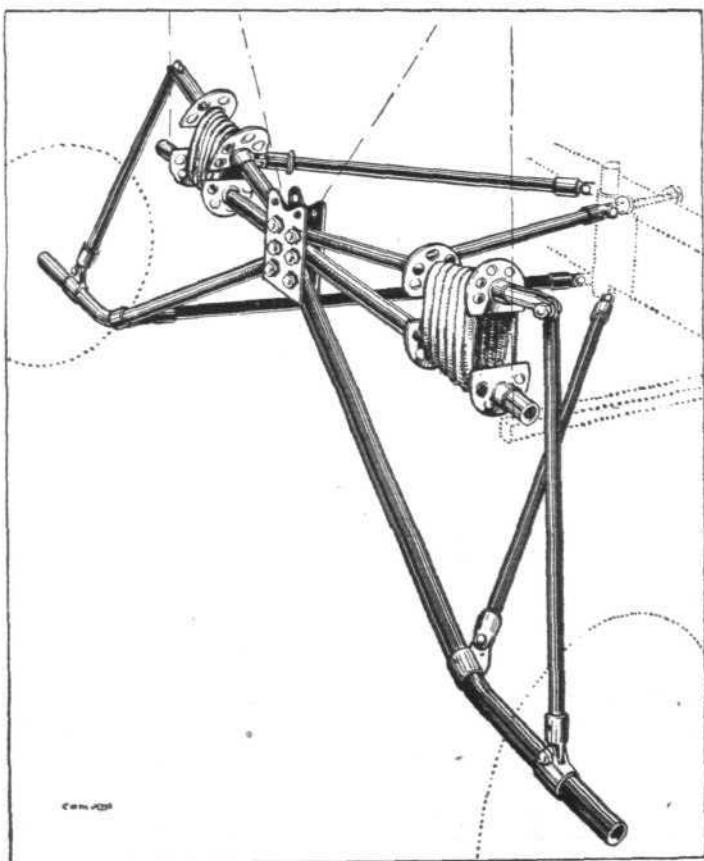
gallon, which leaves him ample time to search out a landing ground before his supply is exhausted.

The A.B.C. "Scorpion" engine is mounted on special patented vibration-absorbing units, which have been found after extensive use to reduce almost to vanishing point the amount of vibration transmitted to the fuselage structure.

The dimensions of the Comper "Swift" are: Length, o.a., 18 ft. 9 in.; wing span, 24 ft.; wing chord, 4 ft.; aspect ratio, 6; wing area, 90 sq. ft.; tare weight, 350 lbs.; gross weight (for aerobatic C. of A.), 670 lbs.; wing loading, 7.4 lbs./sq. ft.; power loading, 16.7 lbs./h.p. It is estimated that the "Swift" will cruise at something like 80 m.p.h. for a petrol consumption of 40 miles per gallon. The machine has not, at the moment of writing, been tested at Martlesham, but it is estimated that a top speed of 105 m.p.h. should be attained, while the landing speed should be about 35 m.p.h. The range at cruising speed should be in the neighbourhood of 350 miles.

As the Comper Aircraft Co., Ltd., is a comparative newcomer to the British aircraft industry, a few words concerning its composition may not be without interest. Upon leaving the Royal Air Force, Flight-Lieut. Comper decided to form a small company for the purpose of building and marketing certain types of aircraft which he has had in mind for some considerable time, but which could not well be realised while he was serving in the R.A.F. The company as at present constituted includes on the board of directors Flight-Lieut. Nicholas Comper (managing director), Mr. G. H. Dawson (chairman), Mr. Adrian Comper, Mr. A. Mouldsdale, and Mr. J. B. Allen.

The head office and works of the Comper Aircraft Co., Ltd., are situated at Hooton Park Aerodrome, Cheshire, the works having been built during the War for the erecting of American-built Handley Page machines. The Armistice came, and the works were not required, but they will now be put to good use. Hooton Park aerodrome is situated on the strip of land between the estuaries of the rivers Dee and Mersey, and is within a few miles of Birkenhead and Chester. The aerodrome itself is a very good one, and the situation is such that there would be no great difficulty in arranging for testing seaplanes, should the firm decide later to produce this type of machine. The workshops are so arranged that the raw material enters at one end and the finished machines emerge at the other, on to the actual aerodrome. Moreover, the shop space available permits of expansion to almost any extent, so that altogether the firm is in a favourable position to go into quantity production with its machines, of which the "Swift" is the first.



The Undercarriage of the Comper "Swift" is of somewhat unusual arrangement. (FLIGHT Sketch.)

THE AUTOGIRO

Flown by Sir Sefton Brancker

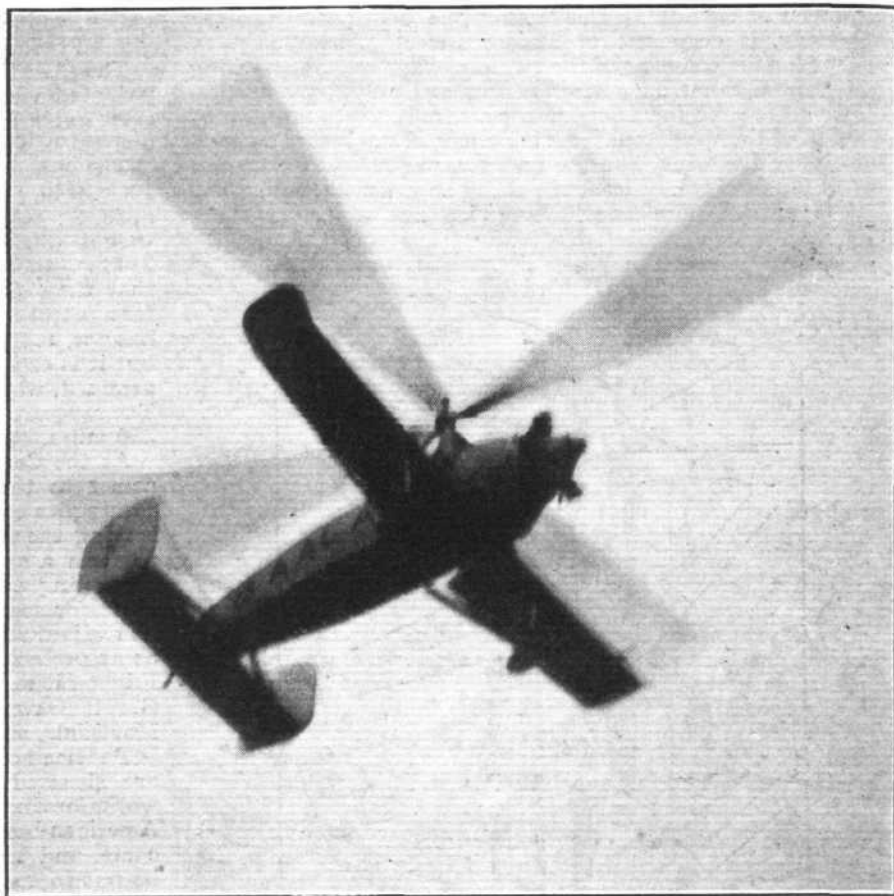
ON January 7 a demonstration flight of the Autogiro C.19 Mark II was made at Heston Air Park. The pilot was Flight-Lieut. A. H. C. A. Rawson, and the second seat was occupied by Sir Sefton Brancker, Director of Civil Aviation. The machine was fitted with dual control, and for part of the flight the D.C.A. himself piloted the machine and made one take-off and one landing.

The appearance of the machine is best described by the photographs. It is one of the tiniest two-seaters ever seen since the second Lympne meeting. The Moths which were on and over the aerodrome at the same time looked quite large aeroplanes beside it. The front seat is directly under the four uprights of the pylon which supports the vanes, and Sir Sefton had to make himself very slim to get in and out.

The pylon inclines somewhat to the right side of the machine, and after landing it is as well to draw up with this side opposed to the wind. The wings on each side are not merely booms to support ailerons, but actually give about 20 per cent. of the lift at full speed. At the end of each is a keel surface set at a pronounced dihedral angle. The undercarriage has a very wide track, and the oleo leg gives an 8-in. travel. A great deal is apt to be asked of this undercarriage, and on this occasion it did its work well.

The empennage constitutes the most notable feature of this type of autogiro. The fins and rudders are double. Between them are arranged the tail plane and elevator in biplane formation. The chord of the tail plane is equal to the gap between the two. A simple control in the cockpit raises these two surfaces to a vertical position, so that they present a wall, flanked by the fins, to the slipstream of the propeller, and deflect it upwards on to the rotor blades and set them in motion. In practice it is usual to start them off with a gentle push of the hand, but on this occasion they actually commenced to rotate when the machine moved, before a hand had been laid on them.

While the machine is still standing still, the deflected slipstream will work the rotor blades up to 95 r.p.m., but when the pilot commences to taxi forward their speed increases rapidly. When they reach 140 r.p.m. it is safe to take off. Their normal speed in the air is 160 r.p.m.,



IN FULL FLIGHT: Although not revolving at more than about 160 r.p.m., the rotor blades of this "Autogiro" defeated our photographer. (FLIGHT Photo.)

but when the engine is shut off they work up to 170 r.p.m. The best take-off made has been after a run of 30 yards.

The top speed of the machine is given as 95 m.p.h., and the minimum speed at 28 m.p.h. Flight-Lieut. Rawson said that the normal way of landing was to approach the aerodrome at 40 m.p.h. and when about 20 ft. off the ground to jerk the nose up and pancake down. The machine stops dead where it lands, but wheel brakes are also provided.

The engine is an Armstrong-Siddeley 100 h.p. "Genet Major." When we arrived on the aerodrome it was suffering from magneto trouble, which gave an opportunity to see how very quickly the engine cowling can be taken off and put on. However, the engine was not giving its full revolutions,



THE CIERVA "AUTOGIRO": The machine is seen during its take-off run. Note that the rotor blades have not yet risen to their normal flying position. (FLIGHT Photo.)



TESTING THE "AUTOGIRO" : On the left Sir Sefton Brancker, Director of Civil Aviation, and on the right Mr. Nigel Norman, one of the owners of Heston Air Park. (FLIGHT Photo.)

and this somewhat detracted from the performance of the autogiro.

The first run was rather a long one, and the machine climbed somewhat laboriously. Slow flying, however, is one of the attractions which the autogiro offers the pleasure-seeker, and this quality was emphasised by the Moths which flashed past it and round it as though it were a candle. Quite apart from the rotors, the tiny fuselage, the wide undercarriage, the turned-up wing tips, and the double fins, make this machine one of the weirdest fowls ever seen in the air, at least since the days of the box kite.

The eerie effect was increased when the pilot pointed the

machine towards the spectators, and allowed it to sink towards the earth. Actually it was moving forwards as well as downwards, but this was not apparent from the end-on view. The appearance was that of an abnormally steady parachute. After losing two or three hundred feet, the pilot opened up the engine and flew on once more.

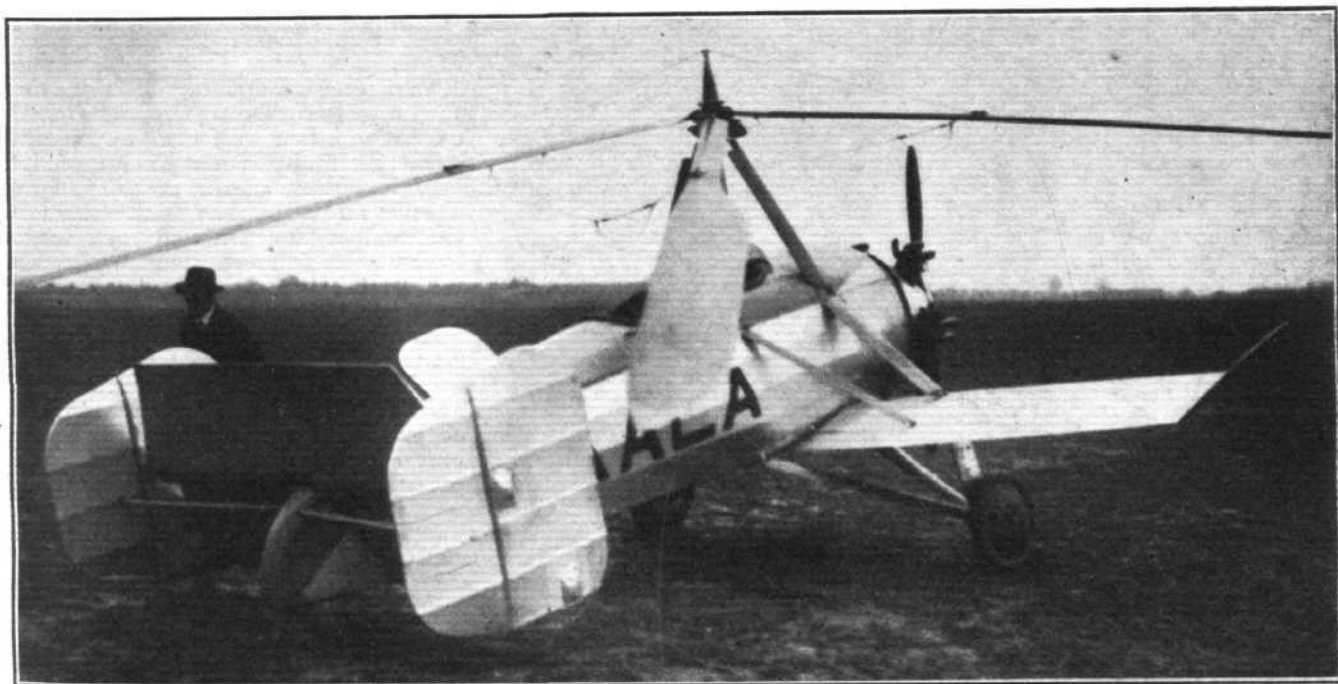
The first landing looked like a very heavy pancake, from a generous 20 ft., but the undercarriage took it easily. The machine pulled up, but before the blades lost flying speed Sir Sefton took the joystick and took off again. This time the engine was warmer, and the run was shorter. Sir Sefton also made the second landing, and put the machine down quite gently. Then the test pilot took charge again and made a couple more landings.

When Sir Sefton had extricated himself from the pylon struts, he said that he had found the autogiro very easy to fly—in fact, anyone could fly it. He said it was very comfortable, and, though it was quite a bumpy day, the bumps had far less effect upon the autogiro than upon an ordinary aeroplane. He said that the machine gave him a feeling of complete confidence. He felt that nothing could go wrong. He found no unpleasant sensation from the rotors whirling above his head.

Then, turning to the inevitable microphone, Sir Sefton said that when Mr. de la Cierva first lectured on his invention to the Royal Aeronautical Society, he at once became a very strong advocate of the principle of the autogiro. The experiences of this afternoon had confirmed him in his conviction that the autogiro had a great future—especially for citizens of a great city like London, in enabling them to get out quickly into the country or to the aerodromes where airways start and finish. He con-

gratulated the inventor and the company on their progress.

Striking as were the words of the D.C.A., it was almost more striking to hear a private owner-pilot who was present say that he looked forward to the time when the autogiro should be fully developed. He lived in a distant county, and he had frequent business in London. He liked to fly to and fro, but, though he enjoyed flying by night, he never felt quite safe in doing so. With an autogiro he would feel quite safe, and he would not mind a bit if he got home half an hour later in the evening. If he were forced to land, he was sure that he could put an autogiro down anywhere with safety and probably without damage.



THE SELF-STARTER: In this view the elevator is at its maximum position for deflecting the slipstream on to the rotor blades. (FLIGHT Photo.)

THE "THIRD ROUTE"

(Concluded from page 109.)

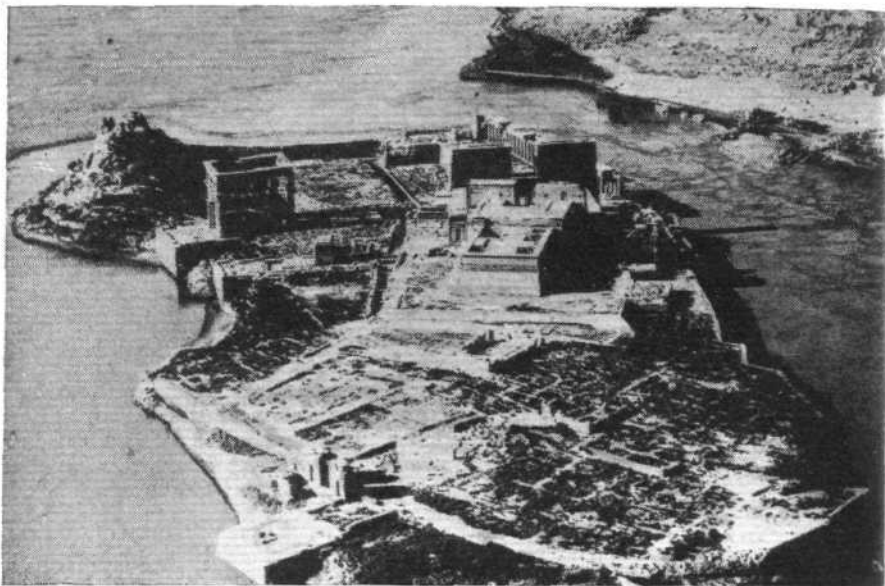
THE first item of interest was the Arch of Ctesiphon, a fine example of Sassanian architecture, next came the mound, which is all that is left of Babylon, and the excavations now in progress can be seen clearly from the air. After this the walled city of Najaf, the most holy city of Iraq, came into view, and it is here that it is reputed the bones of Ali, son-in-law of the Prophet, lie. The golden-domed mosque in the centre is surrounded by countless smaller turquoise blue ones which give the whole a jewel-like appearance, and well it may, for the treasure stored in these mosques is incalculable, as every true Shiah Muhammedan wishes to be buried there and the nearer to the centre he gets the more he has to pay for it.

Not long after, Basra was reached, and it looked like an eastern Venice with its canals and gondolas. On October 13, an early start was made on the final stage of the journey to India, and the course lay down the northern shore of the Persian Gulf past Abadan, where the oil refineries of the Anglo-Persian Oil Co. are situated. The coast is extremely wild and continues so all the way from Bushire to Henjam Island, where a stop was made for the night. When nearing the island the starboard engine showed signs of giving out and on landing it was found that the camshaft housing had fractured, but this was repaired by the artificers of the sloop "Crocus" and a fresh start was made in the morning. However, the repair was not entirely successful and just before reaching Jask the engine gave out again.

At Jask further repairs were made and the final stage to Karachi was completed on October 15. The Makran coast along which the route lay, was as wild as the previous parts, and it is no wonder that Alexander got through only with the greatest difficulty.

After a visit to the airship shed and the mooring mast a start was made in a Hinaiidi for Sir Philip's round of the six squadrons in India which necessitated a trip of some 2,500 miles via Jodhpur, Delhi, Ambala, Simla, Lahore, Peshawar, Quetta and back to Karachi. The first stage was to Jodhpur where an interesting insight was obtained into the life of a native city.

Next day Delhi was reached and the new Government buildings admired and the quarters, which the R.A.F.



Philae. "Pharaoh's Bed" is the edifice on the left.

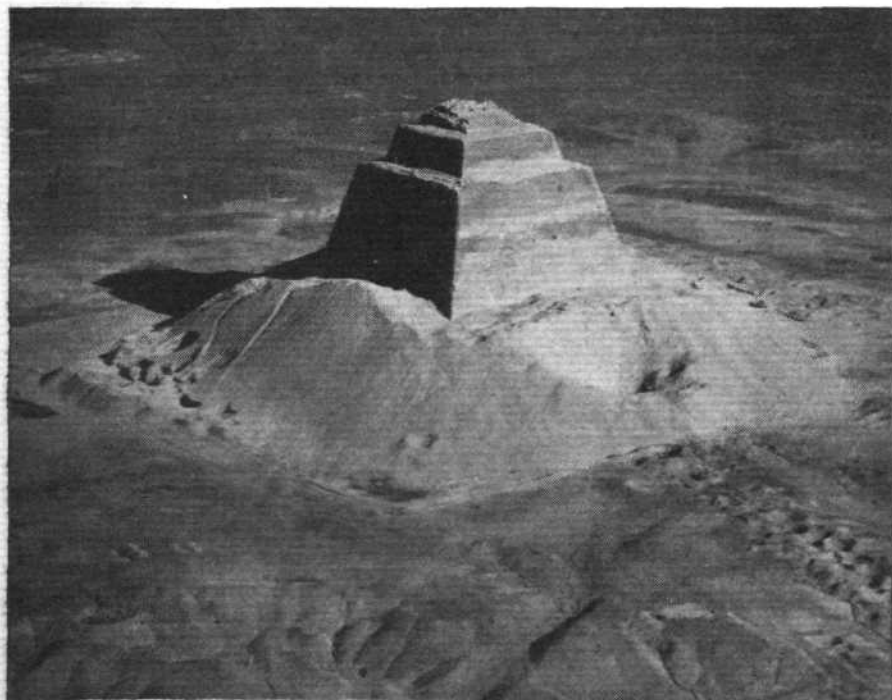
(R.A.F. Official. Crown Copyright reserved.)

Headquarters will occupy when they come down from Simla, were inspected and then the journey was continued to Ambala where No. 28 Squadron were inspected. Sir Philip then had two days' rest which he spent with the Viceroy at Simla. A visit was paid to the Aircraft Park at Lahore; this park supplies five squadrons on the frontier and does all repair work to motor transport.

Peshawar was the next to be visited and the flight across the four rivers of the Punjab with a view of the Kabul Gorge was most impressive. Here are the Group Headquarters which administer the R.A.F. Squadrons stationed on the frontier and after changing over from the Hinaiidi to a Bristol Fighter a rapid tour of these units at Peshawar, Risalpur and Kohat was made. The inspection of the Peshawar unit was made very early and then the course lay up the Khyber Pass, past Jumrod Fort until Afghanistan could be seen with the snow-capped Tirah mountain away to the west; having flown as far as Landi Kotal the mountains were crossed and a return was made via the Kohat Pass. This round served to show that the country was not one for forced landings and the views from the air further enhanced the magnificence of such works as the road made by Lord Roberts, whose men had to work without topees or any of the amenities of the present day.

Early the next morning the return journey to Karachi was started, the way lay down over Waziristan, with a call at Miram Shas where Sir Philip visited Aircraftman Shaw, who is better known as Col. Lawrence. Further on lay Jacobabad, with a fine view of the Sukhar Barrage and their irrigation works which will feed the plains of Sind.

Karachi was reached without further incident and a start made for Basra the following morning in the "Iris." At Gwadar a stop was made to refuel, and shortly after leaving there, the starboard engine gave out again, which necessitated leaving the "Iris" at Jask to wait for a new engine while the party went on to Basra in an Hinaiidi. This break enabled Sir Philip to spend longer in Iraq than he had intended to do, and a stay was made with No. 84 Squadron at Shaibah close to Basra, and from there a trip was taken up to the excavations at Ur. Here was seen the Ziggurat which is in a fair state of preservation. A visit was also paid to No. 6 Squadron at Mosul, and on the way Samarra was passed, which is the fourth holiest city of Iraq, a very good idea can be obtained of the size of the vast city, which Caliph Mutassim built on the same site when

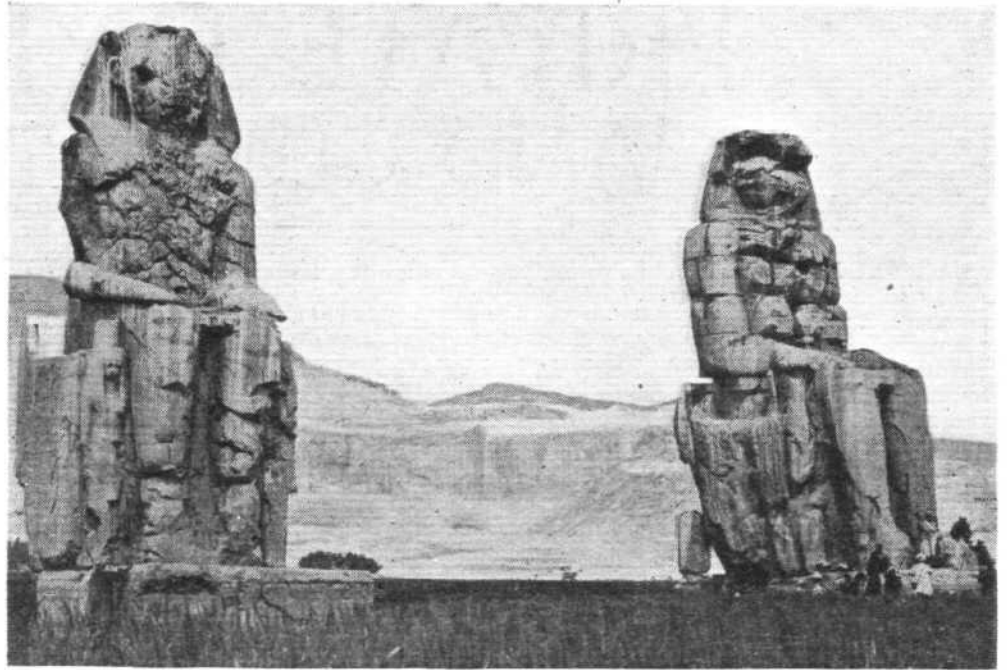


Maidam Pyramid.

(R.A.F. Official. Crown Copyright Reserved.)

he removed his capital and court there from Baghdad, when one flies over it, as the lines of the roads and buildings stand out very clearly. Mosul itself is an interesting city, and the relics of Nineveh form promising ground for excavation. The frontier country around Mosul is very wild, and not unlike the Himalayas, and is certainly no place for forced landings, it is here there is the city of Erbil, said to be the oldest inhabited city in the world.

Just after returning to Baghdad, the "Iris" with the new engine, passed by on her way to Aboukir and on November 2, the party set off in the Hinaiidi to meet her. Bad weather was met which delayed the journey somewhat, but after being delayed at Rutbah, a long trip was made through to Cairo on the following day. A start was made on the homeward journey in the "Iris" on November 7, and the course lay along the northern shores of Africa to Sollum and then on to Benghazi and finally across to Malta. Here are the Headquarters of the



The Colossi of Memnon.



Ur of the Chaldees.

(R.A.F. Official. Crown Copyright Reserved.)



Alexander's Bridge at Zako.

R.A.F. in the Mediterranean. Continuing from Malta the journey was made via Naples, Marseilles and Lake Hourtin to Calshot. Etna was in the throes of an eruption as the "Iris" passed, which made a very awe-inspiring spectacle.

Sir Philip ended his lecture with an appreciation of the splendid work which had been recently done by, and with a reference to the tragic ending of, Sqd.-Ldr. Jones-Williams and Flt.-Lt. Jenkins, who met their deaths when attempting to beat the world's record long-distance flight, by flying from Cranwell to Cape Town in a Fairey Napier monoplane, specially constructed for the flight. They made a speed of 112 m.p.h. to Sardinia but reached the African coast after sunset and before moonrise. They were caught in a storm and evidently lost their bearings. They crashed on a mountain south of Tunis.

PRIVATE FLYING AND CLUB NEWS

AUTO-AUCTIONS, LTD., of Burlington Gardens, although one of the new-comers to the aviation business have shown that their action in obtaining the sole selling rights of a popular light aeroplane which had distinctive features enabling it to stand out from its rivals, had behind it a keen appreciation of the requirements of the market, and they have already done a very great deal to further the gospel of aviation. There is no doubt that by relieving the manufacturer of the cares of the selling side they strengthen his position because he can then concentrate solely upon manufacturing without bearing the overhead costs of a world-wide selling organisation, while the selling agents, in this case Auto-Auctions, can utilise their specialised knowledge to a far better advantage than if they were just agents, and as sole agents they can give a far better attention to the whole question of selling and servicing than they could otherwise do. Auto-Auctions have behind them a vast store of experience in selling and servicing motor cars on which they can draw, and they are finding that the two have a very great deal in common as regards these problems.

Their first and chief servicing station is at Heston Air Park, and they are keeping a demonstration machine there and have made all the necessary arrangements for repairs or any other attention that any owner can want. Agents are being appointed in all parts of the world, and those in Australia and South Africa have been definitely fixed up; in this country agents will be appointed in various centres in the country districts and, as with motor cars, particular care will be taken to ensure that these agents maintain a stock of spares and are in every way qualified to act as service depots of the highest order.

The Blackburn Aircraft Co., Ltd., are themselves not manufacturing the "Bluebird" although they are the designers, but on obtaining the orders from Auto-Auctions, Ltd., they pass them on to Saunders-Roe, Ltd., of Cowes, who are making the machines for them.

Saunders-Roe, Ltd., as the old firm of Saunders is now called, since the acquisition of the controlling interest by Sir A. V. Roe and Mr. John Lord, have made extensive developments in the various factories they have at Cowes, and they are putting the "Bluebird" into production on the most modern lines. The "Bluebird" being an all-metal aircraft and, moreover, the only light aeroplane in production, with metal wings, lends itself admirably to the development of modern production methods. From the outset, they have carefully designed press tools, and as many of the fittings as possible are built up from stampings. At the present, orders have been placed for 65 machines and the first batch of six of these, with Cirrus III engines, were flown up to Hanworth Park, on Tuesday last, the 14th. The occasion was made one of some importance and a party of passengers were asked down to Cowes by Sqd.-Ldr. Ridley, of Auto-Auctions, Ltd.,

on the Monday. At Cowes they were the guests of Mr. John Lord, of Saunders-Roe, Ltd., who, as everyone knows, is a most entertaining host, and after arriving at Hanworth, Mr. G. E. F. Boyes, who had flown one of the machines up, entertained the party to lunch on behalf of N.F.S.

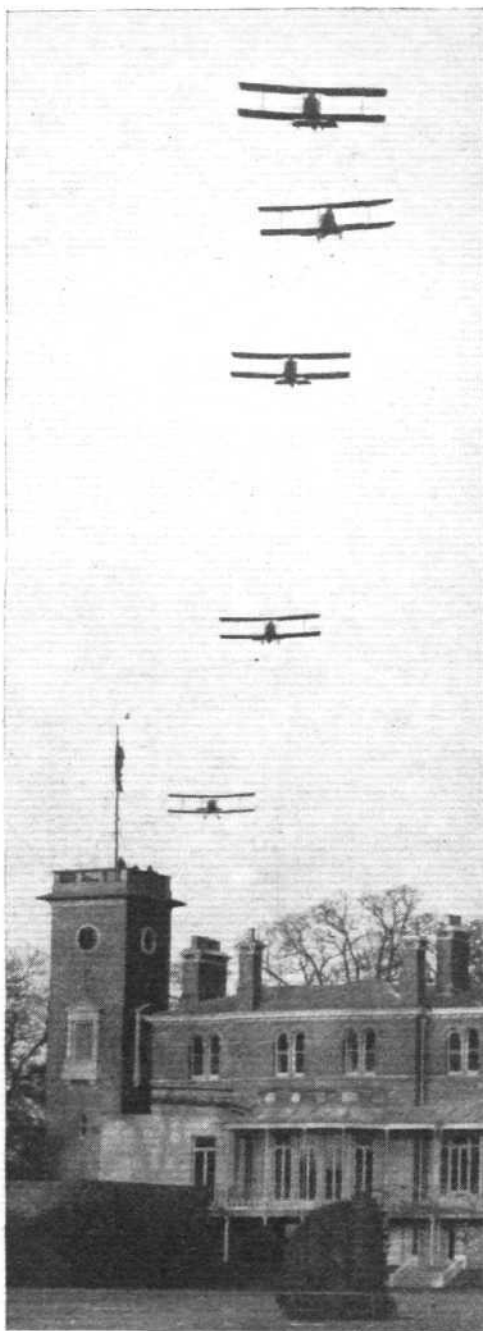
The "Bluebirds"—albeit painted in the lurid colours of N.F.S.—left Cowes in formation led by Capt. Stack, who is in charge of all flying at N.F.S., and arrived at Hanworth, a distance of 86 miles, in about 40 mins.! The tail wind and the conditions in general made the trip somewhat bumpy, but the "Bluebird" proved to be quite comfortable under these conditions. The passenger has ample room, except possibly for an out-size passenger travelling with an out-size pilot, and the cockpit is comparatively free from draughts. One would suggest that some means were devised whereby the passenger could rest his feet, as the dual control rudder bar is so designed that a fork on the vertical shaft prevents even that being touched without affecting the pilot, and in rough weather it is decidedly uncomfortable to have to sit for long with one's legs in a cramped position without being able to stretch them at all.

The advantages of flying side by side can be gainsaid by no one, and in the "Bluebird," speech is quite possible without ear 'phones, in fact, the best advertisement for this point was an occurrence which happened recently when a certain pilot took up a passenger who yelled to such an extent that the wretched pilot was forced to stop him at once and in a nearly normally-pitched tone of voice told him "not to burst my ear drums!"

The view from the cockpit is quite good and the disadvantage of the wing above is minimised as much as possible; a point which struck the writer was the absence of vibration, the machine being certainly one of the smoothest running which has been tried. The luggage locker is hardly adequate for the needs of most private owners on tour, at least, the door of the locker is certainly too small, but it seemed as if the space available for the locker had hardly been used to the best advantage, and having as it does a canvas bottom which is situated directly above the control wires, further improvements seem to be indicated.

The seats might be greatly improved if the cushion at the back was brought right up to the fuselage fairing, which would do away with the space behind the shoulders and prevent the top of the cushion catching one in the small of the back; a further suggestion in this connection would be the utilisation of the space behind the extended cushion and the top of the luggage locker for a small locker to carry the tool roll.

N.F.S. will now be carrying out a rather interesting experiment. They will be keeping the two instructional fleets composed of "Bluebirds" and "Moths" separate, and will



The first flight of "Bluebirds" (Cirrus III) "rolling" home over Hanworth Club. (Flight Photo.)



Flight-Lieut. H. Schofield (who is in charge of instructional flying at Hanworth) with Miss Macdonald, who obtained her "ticket" after a course of instruction given as the result of a Reid testing apparatus at the Aero Show, in one of the new "Bluebirds" (Cirrus III). (FLIGHT Photo.)

thus be able to compare thoroughly the relative merits, as training machines, of the two types.

Taken all round, there seems every possibility of the side-by-side seating becoming the type which is most sought after, if only on the score of sociability; and with such a live organisation behind it as Auto-Auctions to look after the sales and service and with N.F.S. taking it up as a training machine and thereby introducing it to many potential private owners, we may soon see it becoming one of the most popular types.

MISS AMY JOHNSON, a member of the London Aeroplane Club, who has over 70 hours' flying to her credit, has recently qualified for the A.M. ground engineer's licence "A" and is hoping to shortly take her "B," she is thus the first woman to gain a G.E.'s licence. She is also a B.A.

THE DESOUTTER (HERMES) was recently tested by Sir Sefton Brancker, who flew as a passenger with one of his technical officers, Mr. Collins, to Martlesham and returned the same afternoon. He was flown by Flt.-Lt. A. Styran, who is in charge of commercial flying at Hanworth Club, and on his return he expressed himself as very impressed with the comfort of the machine.

THE CINQUE PORTS FLYING CLUB are lucky in having Mr. Ashwell-Cooke, who has presented a cup to be competed for monthly between private owners. The competition will be a landing one in which the pilot must shut off his engine at 500 ft. before coming in, and marks are deducted from the allotted total for any distance in excess of 50 yds. between the tail skid when the machine has come to rest and the mark which has been selected on the aerodrome. Pilots, not being members, may compete, providing they are not holders of "B" licences, employed by any firm in the aircraft business, or serving pilots of H.M. Forces. The first competition will take place on Sunday, February 2, at 11.45 a.m.

THE DUNLOP AERO CLUB, although founded in October last year, is one about whom we have heard but little. The Chairman is Col. Matthew and the objects of the club are to promote flying practice for its members. The present membership consists largely of ex-R.A.F. or R.F.C. officers with previous flying experience, but there are already many others who are hoping to take their "tickets" as soon as possible. At present the position of the club has precluded the obtaining of an aeroplane, but it is hoped to be able to do so in the near future, and until then a comprehensive scheme of lectures and ground instruction has been arranged.

THE BRITISH GLIDING ASSOC., has now been formed with Mr. Howard Flanders as the Hon. Sec., and the R.Ae.S. has kindly allowed the use of its address at 7, Albemarle St., until the Gliding Assoc. has been able to start its own office. Air Vice-Marshal Sir Sefton Brancker has con-

sented to become the first President, and the first meeting of founder members and prospective members will be held on March 25. Founder members can be enrolled up to that date at £1 1s. In this connection it will be well to remember that Dr. Walter Georgii is coming over from Germany, with Herr Stahmer from the Wasserkuppe Gliding School at Darmstadt, to lecture before the R.Ae.S. in the lecture hall of the Inst. Electrical Engineers, Savoy Place, on February 19.

THE SINGAPORE FLYING CLUB has instituted a lecture course on subjects connected with aviation, and these will be given by Flt.-Lt. S. H. Potter their chief instructor. As an elementary navigation test for "A"



Hassenein Bey, the first Chamberlain to King Fuad, has recently acquired the Moth G-EBTD (of the 600 hours test fame). He hopes to fly to Egypt in this machine, which he has named Princess Faika. (FLIGHT Photo.)

pilots a "round the island" flight has been instituted. The flying time for November amounted to 85 hrs. 35 mins.

THE COMTE DE SIBOUR, the well-known War-time pilot who, it will be remembered, recently completed a trip round the world in a Gipsy-Moth with his wife, is now acquiring a Gipsy-Moth with a metal fuselage on which he proposes to make a trip to Arabia, again accompanied by his wife.

THE DE HAVILLAND AIRCRAFT Co., LTD., are now in a position to sell to the purchaser of a Gipsy-Moth a sectioned garage which can be erected in any field of ade-

quate size reasonably near his residence. This is a great advantage to those who do not happen to live within easy reach of an aerodrome where a light aeroplane with folding wings, such as the Moth, may be housed at a weekly charge of approximately £1, including the services of an engineer to assist in its removal from the lock-up, starting, etc.

CAPTAIN MUIR, with a passenger, recently flew Avian G-AAAT fitted with Cirrus Hermes engine, on a special charter for the *Daily Mail*, from Pendine Sands to Croydon, a distance of 190 miles, in 85 minutes. That is an average speed of 132 miles per hour!

THE LIGHT 'PLANE CLUBS

BELOW we give the latest list of the Flying Clubs in this country, together with the addresses of the club secretaries. In order that this may be of the same use to readers which we have been told it used to be we should be glad if all clubs would make a point of informing us when any change is made in their secretary of the address.

Bedfordshire Aero Club. Secretary, Capt. C. Steffox, "Winsthorpe," The Embankment, Bedford.

Berks, Bucks and Oxon Aeroplane Club, (N.F.S.), Woodley, Reading. Secretary, Miss L. Cribb, 12, Highmoor Road, Caversham, Reading.

Bristol and Wessex Aeroplane Club, Whitchurch, Bristol. Secretary, Major G. S. Cooper.

Cinque Ports Flying Club, Lympne, Kent. Secretary, A. Dallas Brett, 114, High Street, Hythe, Kent.

Dunlop Aero Club. Secretary, H. W. Parkes, Fort Dunlop, Erdington, Birmingham.

Halton Aero Club, Halton. Secretary, F/O. C. H. Latimer-Needham, No. 1 School of Technical Training, Halton Camp.

Hampshire Aeroplane Club, Hamble, Southampton. Secretary, H. J. Harrington.

Hanworth Flying Club (N.F.S.), Hanworth, Middlesex. Secretary, Capt. the Hon. J. B. Rodney.

Household Brigade Flying Club, Heston Air Park, Hounslow, Middlesex. Secretary, c/o Guards' Club, London, W.1.

Hull Aeroplane Club, Hedon Aerodrome. Pilot-in-charge, Captain Ayre.

Lancashire Aero Club, Avro Aerodrome, Woodford, Cheshire. Secretary, H. B. Burgess.

Leicestershire Aero Club, Desford. Secretary, H. Purt, 3, Granby Street, Leicester.

Liverpool and District Aero Club, Hooton Aerodrome, Hooton, Cheshire. Secretary, Captain Ellis.

London Aeroplane Club, Stag Lane Aerodrome, Edgware. Secretary, Commr. H. E. Perrin, 3, Clifford Street, London, W.1.

Midland Aero Club, Castle Bromwich, Birmingham. Secretary, Major G. Dennison, 22, Villa Road, Handsworth, Birmingham.

Newcastle-upon-Tyne Aero Club, Cramlington Aerodrome, Northumberland. Secretary, John Bell, 41, Coniston Avenue, Newcastle-on-Tyne.

Norfolk and Norwich Aero Club, The Aerodrome, Mousehold, Norwich. Secretary, G. McEwen.

Northamptonshire Aero Club, Sywell Aerodrome, Northampton. Secretary, P. Hayward, 20, Market Square, Northampton.

Nottingham Aero Club (N.F.S.), Tollerton, Nottingham. Secretary, C. R. Sands, A.C.A., 30, Park Row, Nottingham.

Plymouth Aero Club, Roborough. Joint Secretaries, T. R. Whittley, Dominion Chambers, Drake's Circus, Plymouth; C. Roberts, 35, Connaught Avenue, Plymouth.

Scottish Flying Club, Moorpark Aerodrome, Renfrew. Secretary, G. Baldwin.

Southern Aero Club, Shoreham Aerodrome, Sussex. Secretary, Miss N. B. Birkett.

Suffolk Aeroplane Club, Hadleigh, Suffolk. Secretary, W. J. Offord.

Yorkshire Aeroplane Club (N.F.S.), The Aerodrome, Sherburn-in-Elmet, Yorks. Pilot-in-Charge, Captain Worrall.

"Cirrus" Appointments

His many friends will be glad to learn that Major J. Stewart has been appointed Joint General Manager of Cirrus Aero Engines, Limited. The other General Manager is Mr. W. H. Peak, O.B.E., who is new to the aviation industry, but whose organising ability has been amply proved with firms of such high standing as the Stirling Telephone section of the Marconi organisation.

"Jack" Stewart has (and it will probably come as a bit of a surprise to his friends) been associated with A.D.C. Aircraft, Ltd., since the formation of that company, i.e., something like ten years, and as Sales Manager of that firm, and of the more recently-formed Cirrus Aero Engines, Ltd., he has come in contact with nearly everyone connected with or interested in aviation.

The "Cirrus" was the first engine to be produced, suitable for use in light aeroplanes, and it is not too much to say that but for this engine the light 'plane movement would not have reached the stage of development which it holds at the present time. The firm is looking ahead, and the appointments of Major Stewart and Mr. Peak are an important link in the plans for the future. We gather that while Major Stewart will look after the Regent Street office end of affairs, Mr. Peak will establish his headquarters at the factory at Waddon, where his organising experience will be given full opportunity in planning mass production, etc., on the most efficient lines. As heretofore, Captain Walker will remain works manager at Waddon, so that Cirrus Aero Engines, Ltd., start the new year under exceptionally promising conditions.

"Certificates of Airworthiness"

On January 23, Mr. H. B. Howard will read a paper before the Royal Aeronautical Society on "Certificates of Airworthiness." The paper will be delivered in the Lecture Hall of the Royal Society of Arts, 18, John Street, Adelphi, W.C.2, at 6.30 p.m. In his paper Mr. Howard considers in a general way the effect of airworthiness regulations on the design of civil aircraft. He analyses the causes of accidents, pointing out that their occurrence is the acid test for any system of airworthiness. As a result of the analysis Mr. Howard comes to the conclusion that there is no evidence to suggest that our standards are insufficient. In the course of the paper the difficulties of international regulations are pointed out. The paper is one which, by its very nature, should produce a discussion of great value to designers, and it has, indeed, been written with this point in mind.

Memorial Service to Captain Grosvenor

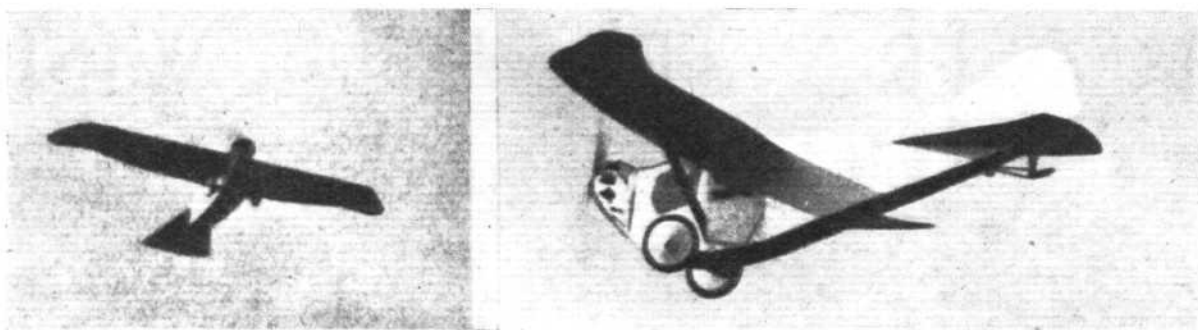
A MEMORIAL service for Captain the Hon. Hugh Grosvenor was held at St. Mary's Church, Motcombe, near Shaftesbury, on January 12.

Death of Prof. Rateau

PROF. AUGUSTE RATEAU, the inventor of the turbo-compressor, used on aero engines, bearing his name, died in Paris on January 13.

R.A.F. Rugby Fixtures

THE following R.A.F. Rugby Football matches will be played this month:—Jan. 22, R.A.F. v. Cambridge University, at Cambridge; Jan. 25, R.A.F. v. Northampton, at Northampton; Jan. 30, R.A.F. v. Leicester, at Leicester.



THE "TAUBE" REVIVED

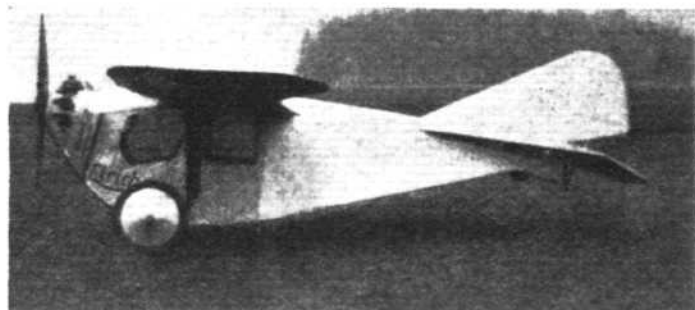
Igo Etrich Incorporates Old Principles in New Machine

AMONG the earliest German experimenters a wing form was popular which had been derived from a study of the Zanon plant's winged seeds. The early German machines incorporating this wing form were given the general title "Tauben" (pigeons), presumably because they had, at a distance, somewhat the appearance of a pigeon flying overhead. The likeness to a pigeon was, however, far from striking. In plan form the wings of the Taube machines were characterised by a rounded wing tip, the trailing portion of which projected considerably aft of the trailing edge of the main wing. These flaps were given a twist so as to form not only a negative incidence in relation to the rest of the wing, but also a negative camber. The object of the arrangement was, of course, stability, chiefly lateral, but also, probably, a certain degree of longitudinal stability due to the fact that the projecting wing tip flaps were aft of the main wing to some extent. It may be recollected that Mr. Handley Page in this country, and about the same time, achieved similar results with his crescent-shaped wing form in which the wings tapered both in plan and thickness, while there was a decided "wash-out" in incidence towards the wing tips. In the "Tauben" lateral control was by flexing the trailing edge wing tip flaps.

Among the Austrian pioneers whose early work on "Tauben" attained considerable success, was Herr Igo Etrich, the "Etrich Taube" becoming fairly popular. One of these machines was purchased by the British Admiralty in 1912 and was flown by the Eastchurch pilots.

If our memory is not at fault, the "Tauben" did in point of fact achieve the "automatic stability" claimed for them, but the price paid for this was somewhat high. It is to be assumed that the drag of a wing which carries at its extremities large trailing edge flaps upturned to give negative incidence and camber must be higher than the drag of a "parallel" wing. Also the early "Tauben" were relatively heavy, in spite of the fact that they had what may be described as

biplane wing bracing: Some two or three feet below the wing was a boom running out to the wing tip forward corner, and connected to the spars of the wing structure by struts, the girder being cross-braced with wire. This undoubtedly added a good deal of drag to a wing which probably already had a fairly high drag, and so it was scarcely surprising that



Side view of the new Etrich "Taube" light plane.

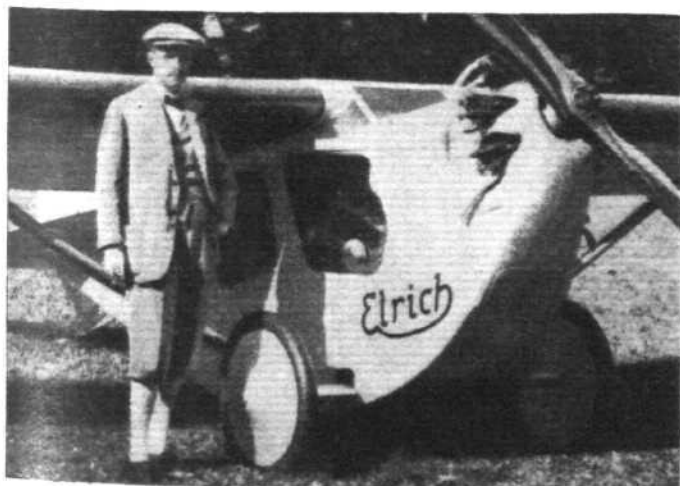
the "Tauben" were somewhat slow and stately machines, and that when the war came they were supplanted by faster types which had not, and were probably not desired to have, the same "automatic stability."

For the private owner-pilot, if he is not in a hurry and does not regard himself as a particularly clever pilot, the stable machine might, however, be worth studying once more in an effort to evolve the "fool-proof" machine. This idea has, apparently, also occurred to Herr Igo Etrich, who has recently revived his old love the "Taube" but has incorporated in its design such improvements as modern knowledge may suggest.

The new Etrich "Taube" has its upturned wing tip flaps less pronounced both in size and twist, and the boom bracing of the old type has given way to a single strut on each side. The fuselage is deep and encloses a *conduite interieure* cabin with seating accommodation for two, the pilot in front. The fan-shaped tail of the old "Taube" has to some extent been retained, but the fixed vertical fin is a large single surface, and the rudder is wholly above the tailplane. In the old type the fin and rudder were usually divided into upper and lower above and below the tail.

The general lay-out of the new Etrich "Taube" is fairly well shown in the photographs. The engine is a 40 h.p. Salmson, and the machine has a length of 6 m. (19 ft. 8 in.), a wing span of 11 m. (36 ft. 1 in.), and a wing area of 15 sq. m. (162 sq. ft.). The weight is about 300 kg. (660 lb.).

The new Etrich "Taube" was built in a very small experimental workshop which Herr Etrich still maintains (his real business is textile manufacture in Czechoslovakia), and largely constructed by non-specialised labour under Herr Etrich's personal supervision. The preliminary test flights were made from a field in the vicinity of Trautenau, and there was no opportunity for accurate performance tests. The top speed, however, appeared to be in the neighbourhood of 150 km./h. (93 m.p.h.) and the landing speed about 50 km./h. (31 m.p.h.). The pilot reported the machine to be very stable, and particularly so on turns, when the lateral control did not need to be used. The take-off and climb were also described as very good indeed.



Herr Igo Etrich has recently produced a new "Taube." This photo. shows the nose, and gives a good idea of the small size of the machine. The engine is a 40 h.p. Salmson. Note the unusual cowling.

AIRISMS FROM THE FOUR WINDS

R.A.F. Flight to the Cape

A FLIGHT of No. 14 Bomber Squadron left Cairo on Saturday, January 11, on the annual formation flight to Cape Town and back. Though the squadron is still officially equipped with D.H. 9a aeroplanes, it is being remounted with Fairey 3 F "general purpose" machines, driven by Napier Lion XI engines, and this type will be used by the Cape Flight. This is the fourth successive annual flight from Cairo to Cape Town and back to be undertaken by the Middle East Command of the Royal Air Force.

Indian Flight to India

MR. MAN MOHAN SINGH, the Indian student of Bristol University, who—as we announced last week—is attempting a flight from England to India for the Aga Khan prize, set out from Croydon on his D.H. Moth (Gipsy) on January 11. Weather conditions at the start were by no means ideal, and he was forced down at Manstone, Kent, but resumed his journey later. The Channel was safely crossed, but bad weather forced him to land at St. Inglevert. Resuming the flight to Paris on January 12, Mr. Singh again experienced bad weather and was forced down at St. Quentin, and after locating his position, continued shortly after on his way to Paris. Bad luck still followed him, however, and he made another forced landing near Noyon and damaged his machine, which was taken to Le Bourget for repairs.

Siamese Air Force Officers in India

OFFICERS of the Royal Siamese Air Force have been paying a visit to the R.A.F. in India, and on January 10, left Delhi for Allahabad en route for Siam.

Looping a Glider

It is reported from New York that Edward B. Heath, a Chicago pilot, has succeeded in looping a glider. He and his glider were towed by an aeroplane to a high altitude, the glider then being released. It is claimed that Heath executed four perfect loops during his descent.

6,000-Mile Flight with Serum

WHEN a woman missionary at Malange, north of Angola, was bitten by a mad dog, some anti-hydrophobia serum was required to save her life. Lieut. King therefore set out from Johannesburg with a supply of serum on December 17, and during his long flight met with several adventures. On one occasion he ran short of fuel when over dense forest near Tsumeb in S.W. Africa, but managed to land safely on a small area of river sand. He landed at Baragwanath aerodrome on January 7, after having completed 6,000 miles.

Aircraft at the Royal Wedding.

OVER 300 aircraft concentrated in Rome on the occasion of the Royal wedding between Princess Marie José of Belgium and the Crown Prince Humbert of Italy. During the wedding ceremony on January 8, the aircraft flew low over the

Quirinal Square and the Palace, and on the following day took part in the King's huge review of some 22,000 men, representing all the armed forces of the Italian State, at which were present, in addition to King Victor of Italy, the King of the Belgians, King Boris of Bulgaria, the Duke of York, and many other royal guests. The aircraft went through some wonderful formation flying.

Low Flying over a School

FLYING OFFICER VINCENT HUMPHRIES NICOLAY, of No. 4 (Army Co-operation) Squadron, was found guilty, at a court-martial at Farnborough, on January 9, of flying too low over thickly-populated parts of Southampton and of performing aerobatics over an infants' school at Sholing.

Woman Pilot Killed

MRS. NEVA PARIS, an American woman pilot of New York, was killed on January 9, when her aeroplane crashed into the marshes of the Satilla River, Georgia, during a flight to an air meeting at Miami.

French Missionary's Pilot's Licence

ACCORDING to the *Daily Telegraph* an air pilot's licence has been granted to Father Toujes, a French Catholic missionary, who proposes to use an aeroplane as a means of communication with the missionary outposts in Oceania. Father Toujes served in a bombing squadron during the war.

Aerial Photography in Belgian Congo

SOME time back the special Commission of the Katanga carried out an experiment in aerial photography in the marshy district of Bukama. The results obtained were so satisfactory that it has been decided to have the whole of the district—which is flooded annually in the Lufira Valley—photographed by the Sabena, including the area from Kapolowe village upstream to the environs of the Madingusha Falls downstream.

Junkers Engine in France

LICENCE to build the Junkers heavy oil engine for France and her colonies has been acquired by the Peugeot Co. Lord Thomson and the Air Arm

LORD THOMSON, Secretary of State for Air, speaking at the 209th annual banquet of the City of London Tradesmen's Club on January 13, said it had been stated that in his present position as Secretary of State for Air he was liable to think that any saving in regard to warships should be devoted to expenditure on yet more terrible weapons of destruction. That had never been his angle. He believed that by the substitution of the aeroplane for the more archaic weapons of defence economies could be effected. But knowing the terrible power of that weapon and how it could be directed against large and helpless populations, he prayed God they would never have to call upon the Service over which he presided.



Air Display at Royal Wedding: A thrilling air display, in which some 300 aircraft took part, was given by the Italian Air Force in Rome on Jan. 9 in connection with the Royal Wedding. Our picture shows three Kings watching the display. King Albert of the Belgians is seen, behind the table, in conversation with King Boris of Bulgaria, while King Victor of Italy is on the latter's right.



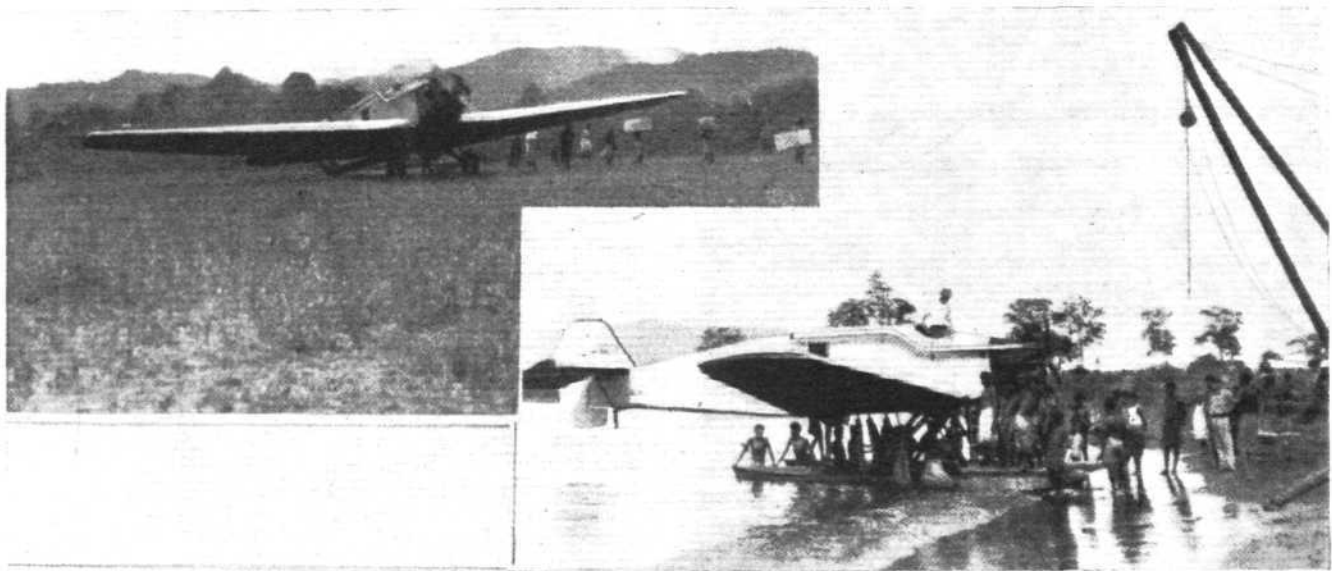
AIR TRANSPORT

FLYING FOR NEW GUINEA GOLD

THE New Guinea gold fields provide a chance for Australian airmen to run an unsubsidised and profitable air line. The land route from the harbour to the gold fields takes 14 days, and is both circuitous and arduous. As a native porter had to carry his own rations for the trip (14 lbs. out of a total load of 50 lbs.), this method of transport was extravagant. In 1926 over 2,000 native "boys" were employed as porters. Then Mr. Mustard, an Australian pilot, started an aeroplane service between the port and the field, and his firm, Guinea Airways, Ltd., has now brought the service up to a high degree of efficient organisation. The air trip takes only half an hour. In one week in November

the firm made 33 trips to the field, carrying about a ton of cargo on each trip. A Junkers monoplane sometimes makes five trips a day, and a D.H. 9C six trips. The cargo carried consists of rice, tinned food, cases of beer, galvanized iron sheets, picks, shovels, sluicing pipes, iron bars, oil engines, pumps, drums of oil, furniture, parts for a wireless station, and mail.

In fact, this air service has proved to be an unmitigated boon to the gold fields. Unfortunately, Mr. Mustard has been obliged, owing to fever, to resign from Guinea Airways, and is now in the aviation department of the Vacuum Oil Co. Pty., Ltd.



FLYING FOR NEW GUINEA GOLD : Two views of a Junkers W.34 (Bristol "Jupiter") monoplane of Guinea Airways, Ltd. On the right, arriving at Lae as a seaplane. On the left, unloading the monoplane (now a landplane).

DOMINION AIR ROUTES

India

INDIA is in some respects a very socialistic country. The Government owns many of the railways, and manages them very satisfactorily. Now, for the time being at any rate, the Government owns the only internal air route in the country, namely, that between Delhi and Karachi. In fact, in India it is the usual thing, when an innovation seems desirable and no private interest will come forward to undertake it, to appeal to the Government. Not infrequently the Government responds.

The way in which the Delhi-Karachi airway is managed is that the Government of India hires a Hercules from Imperial Airways, and makes its own arrangements as to fares, etc. Information as to the rates charged has not yet reached this country. The aeroplane, however, is operated by the Imperial Airways staff. No one particular Hercules is mentioned in the contract. Imperial Airways uses whichever machine comes next on the roster. The machine which arrives at Karachi from Baghdad on Sunday afternoon may go on to Hyderabad in Sind (some 100 miles) the same evening, or another Hercules may be used.

The service between Delhi and Karachi is not of first-class commercial importance. Delhi is not a great commercial centre, but it is the capital of India. Government despatches are important, and it is worth while spending money to expedite them. But this air mail does not materially expedite the delivery of the Government mails. It only saves one night on the train journey. Madras, however, does derive

some benefit from this air mail, as the aeroplane catches an earlier train at Hyderabad, and the mails are delivered in Madras two days earlier than by train transport.

While the Imperial Airways route runs through Central Europe, the company does not find it practicable to publish a time-table in hours. The mails from England arrive at Karachi on Sunday afternoon, and a machine goes on the same evening to Hyderabad, where the night is spent. Next day they are flown on *via* Jodhpur to Delhi, some 600 miles. On the homeward journey, the Hercules leaves Delhi on Monday and flies through to Karachi in the day. The mails leave Karachi for Croydon on the Tuesday morning.

India will not reap the full advantage of air transport until the airway is extended right through to Calcutta, and from there on to Rangoon. Branch lines to Bombay and Madras are also of great importance. A proposal backed by the great Parsi firm of Tata Bros. to run an airway from Karachi to Bombay seems to have come to nothing. But Calcutta, the greatest commercial city in India, if not in all Asia, must be the principal goal. The ideal development will be for the mails to be flown from Karachi to Delhi right through the night. The distance is some 1,400 miles. As yet the route has not been prepared for night flying, and, it may be added, as yet no aeroplane has been specially designed for carrying mails on such a route. Both developments will have to come.

In the meantime we may welcome the enterprise of the Indian Government in opening the Delhi-Karachi airway as an earnest of more to come.

South Africa

Some time next month Capts. Gladstone and Wolley-Dodd and the other members of the mission sent to Africa by Imperial Airways, Ltd., are expected back in London. They should have a very interesting report to make on the route which they recommend for the airway from Croydon to Cape Town. Until this report is received, not very much can be said about the details of the route. It can, however, be stated that three-engined aeroplanes will be used throughout, and that landplanes will fly as far as Khartum, flying-boats from Khartum to Lake Victoria, and landplanes on from the Lake to Cape Town.

There has been much discussion in Cape Town as to the location of the city's air port. When Major Miller, the moving spirit of Union Airways, Ltd., started his air service some months ago, using Moth aeroplanes, the postal authorities arranged with the Defence Department that the mail aeroplanes should use the aerodrome at Maitland, and be housed in part of the military hangar there. Recently, however, the military authorities found themselves unable to continue this arrangement; so the municipal council agreed to erect a temporary hangar at Maitland. This aerodrome, by the way, is situated opposite to a large and active cemetery. Meantime another site, known as Sixth Mile Outspan, between Goodwood and Windermere has been selected as the terminal aerodrome for the Imperial Airways African service, and in due course the Union Airways hangar will be moved there.

The India Air Route

THE route now followed by Imperial Airways, Ltd., on the service to Egypt, Iraq and India is as follows:—Croydon, Cologne, Nuremberg, Vienna, Buda-Pest, Belgrade, Uskub, Salonika, Athens. This route has been adopted owing to the breakdown of the agreement with Italy. Landplanes are used between Croydon and Athens, and Short Calcutta flying-boats between Athens and Alexandria. During the winter months the mail is sent by train on the section Cologne to Athens.

Australian Aerial Services (Lasco)

IN announcing largely extended aerial services for 1930, Australian Aerial Services, Ltd., mention the following units comprising their air fleet as at January 1, 1930.—*Love Bird* and *Diamond Bird*, 9-seater biplanes, fitted with geared 480-h.p. Siddeley "Jaguar" engines; *Wattle Bird*, *Lyre Bird* and *Bell Bird*, 5-seater biplanes, fitted with 240-h.p. Siddeley "Puma" engines; *Sun Bird*, 5-seater biplane, fitted with 330-h.p. "Nimbus" engine; *Whip Bird*, 3-seater Sopwith "Antelope," fitted with a 240-h.p. "Puma"; *Pilot Bird*, dual control training machine; *Lascoler*, 5-seater monoplane, fitted with 240-h.p. "Puma"; *Lascondor*, 7-seater monoplane, fitted with three 165-h.p. Siddeley "Mongoose" engines. The last two machines were designed and built by Lasco. Last month an aerial and ground survey of the Melbourne-Adelaide route, via Mt. Gambier, was carried out.

Western Australian Airways Statistics

THE following are the statistics issued by Western Australian Airways, Ltd., regarding the aerial services operated by them up to December 2, 1929. These figures represent the total to date since the company started opera-

This piece of ground was originally granted by the Government to the local council as an outspan (or parking place) for farmers coming to market. The site has now reverted to the Government, which is giving it free to the Cape Town municipality for an airport. A strip 400 ft. wide along the roadside is being reserved as an outspan. It is estimated that the cost of providing a really modern airport will be £43,000, which is a saving of £7,000 on the original estimate. Port Elizabeth, which is described as the distributing centre of Union Airways, is likewise actively engaged upon the selection of a suitable site for a municipal aerodrome.

Flying interests in Natal have been expressing anxiety as to whether that province will be put into air connection with Great Britain, and there has been a good deal of discussion as to whether Durban or Pietermaritzburg shall be the chief air centre of Natal. The Durban people seem disinclined to spend the money necessary for the provision of a really good aerodrome, while Maritzburg seems to be more fortunately situated.

For the present, at any rate, Imperia Airways will perforce have to concentrate on the main route to Cape Town, and it would not be reasonable to expect them to consider branch lines. It will, of course, be open to local companies to undertake such services.

The air mail routes at present operated by Union Airways are as follows:—Cape Town-Durban, via Port Elizabeth and East London; and Port Elizabeth-Bloemfontein-Germiston and Johannesburg.

tions, eight years ago. The figures in brackets are those for the month of November, the previous month's being published in our issue for December 20 last. Passengers carried: Perth-Derby, 6,917 (120); Perth-Adelaide, 1,807 (290); taxi and joy-ride, 9,773 (148); machine flights, 9,495 (150). Miles flown, 1,361,911 (31,903). Letters carried: Perth-Adelaide, 25,636 lbs. (1,992 lbs.). Freight carried: Perth-Derby, 274,308 lbs. (8,393 lbs.); Perth-Adelaide, 9,201 lbs. (1,192 lbs.).

Proposed German Air Mail to Brazil

HERR WRONSKY, a Director of the Lufthansa, is reported to have made the announcement that during the present year a German air and sea service to Brazil would be opened. This would be in direct competition with the existing French service. The German plan is for the mails to be carried by air to the Canary islands, thence by steamer to Fernando Noronha, and thence by aeroplanes of the Condor Company to various places in South America. It was likewise stated that when the proposed Zeppelin service between Seville and Buenos Ayres is started, it has been arranged that aeroplanes of the Lufthansa and Condor companies will connect with the airship service at either end, so as to distribute the mails in Europe and South America, respectively.

A London-Manchester Air Service ?

It is reported that negotiations are in progress between Imperial Airways and the Northern Air Transport Company of Manchester, for the inauguration of a passenger air service between London and Manchester. It is proposed to connect up at Croydon with the Imperial Airways Continental services, and subsequently the service would open up a service across the Irish Sea to Dublin and Belfast.



Air Transport in Portugal: A Junkers F.13 monoplane, "Lisboa," used on *Servicos Aeros Portugueses*.

AIR TRANSPORT ON A TWENTY-FOUR HOURS' TIME TABLE

Ground Lighting Equipment as the Principal Requirement

By CAPTAIN CHARLES E. WARD

Captain Ward, of the staff of Alan Cobham Aviation, Ltd. is Adviser on aerodrome and air route lighting to Chance Brothers and Co., Ltd., the old-established firm of lighthouse manufacturers.

It is obvious that night flying is an economic necessity for the operation of commercial air transport, in order to secure the full benefit of time saved over other forms of transport, which can operate throughout the 24 hours. At present traffic by air, proceeding at an average speed of 80 miles an hour during the day, is stationary all night, the result being that its average rate of progression drops from 80 to 40 miles an hour, little more than that of a trans-Continental train.

Until facilities for the safe operation of aircraft are provided at terminal airports, emergency landing grounds and on the air routes in between, it will not be possible to conduct air transport on a paying basis without subsidy.

The art of flying through the air by night is just as simple as flying by day, except that a pilot has to rely more on instruments for navigation and less on his senses. Difficulties occur in conditions of poor visibility, especially when these develop during a flight, as a pilot cannot observe changes in weather conditions at night. He needs, therefore, some visual assistance in order to maintain a good course, and this assistance can be provided in its most reliable form by light beacons, similar in operation and effect to lighthouses installed for the guidance of mariners at sea.

When leaving the ground or water at night, an aircraft pilot needs light signals in order to avoid obstacles, and on landing, so that he may glide in safely and make contact with the surface at the correct angle and in the right direction, light is again required, instruments not being sufficiently reliable to assist him.

Ground lighting for the purposes of night flying presents two separate and distinct problems when considered from a military and civil standpoint, the ideal for commercial purposes being to give the maximum assistance by means of artificial lights within reasonable limits of cost, in order to obtain the greatest safety. Considering first of all the lighting of air routes, the object is to provide a series of beacons, each placed in relation to its neighbours so that an airman navigating from one airport to the next, has a visual check on his course at reasonable intervals. The term "reasonable interval" is interpreted according to the average weather conditions and the topographical features of the country between any two airports. It must be assumed that navigation by instruments is essentially the correct method of flying by night, and it is therefore unnecessary

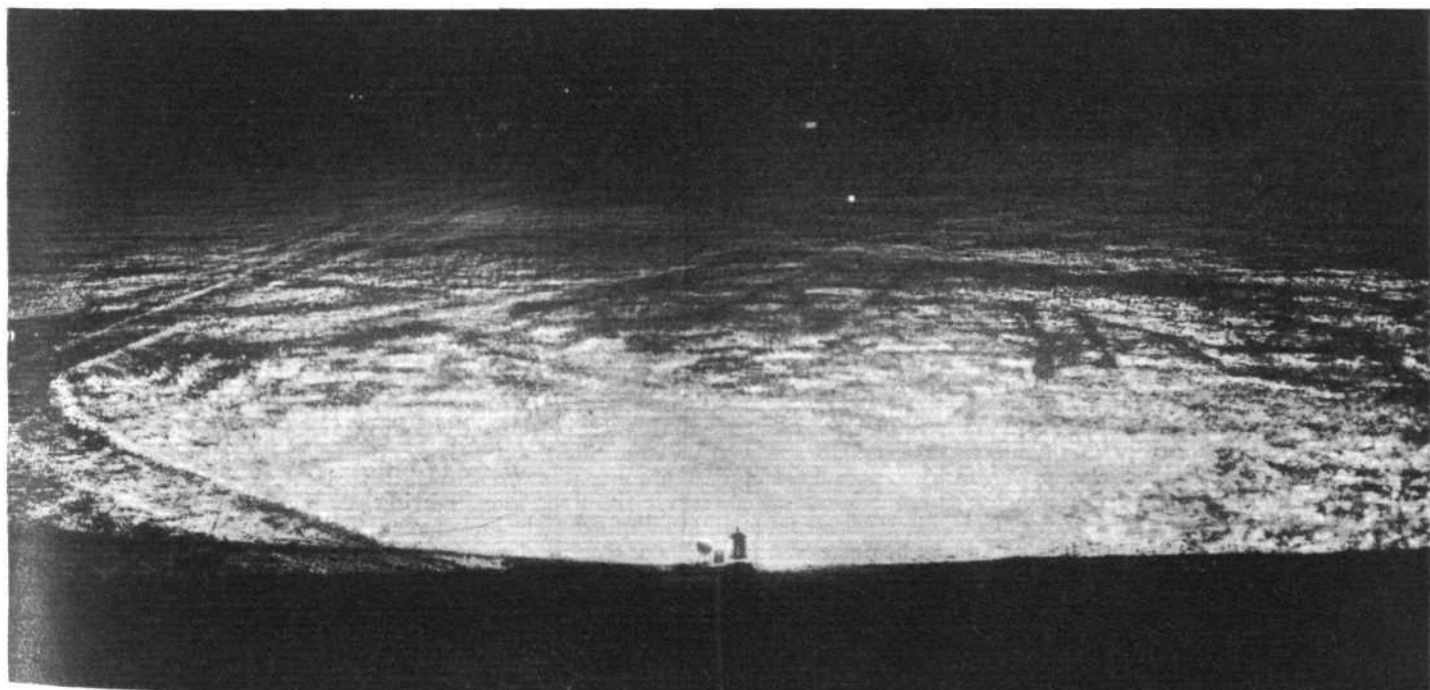
to provide pilots with a lighted street as a guide, except perhaps in hilly country where poor visibility is the rule rather than the exception. A route beacon should have an easily identifiable character, and should mark a known geographical point.

Its power must be such that a pilot flying at any constant height sees the light as one of constant or increasing intensity, as he approaches it, and it must not be so great that it dazzles him if he is flying low owing to clouds or an adverse wind.

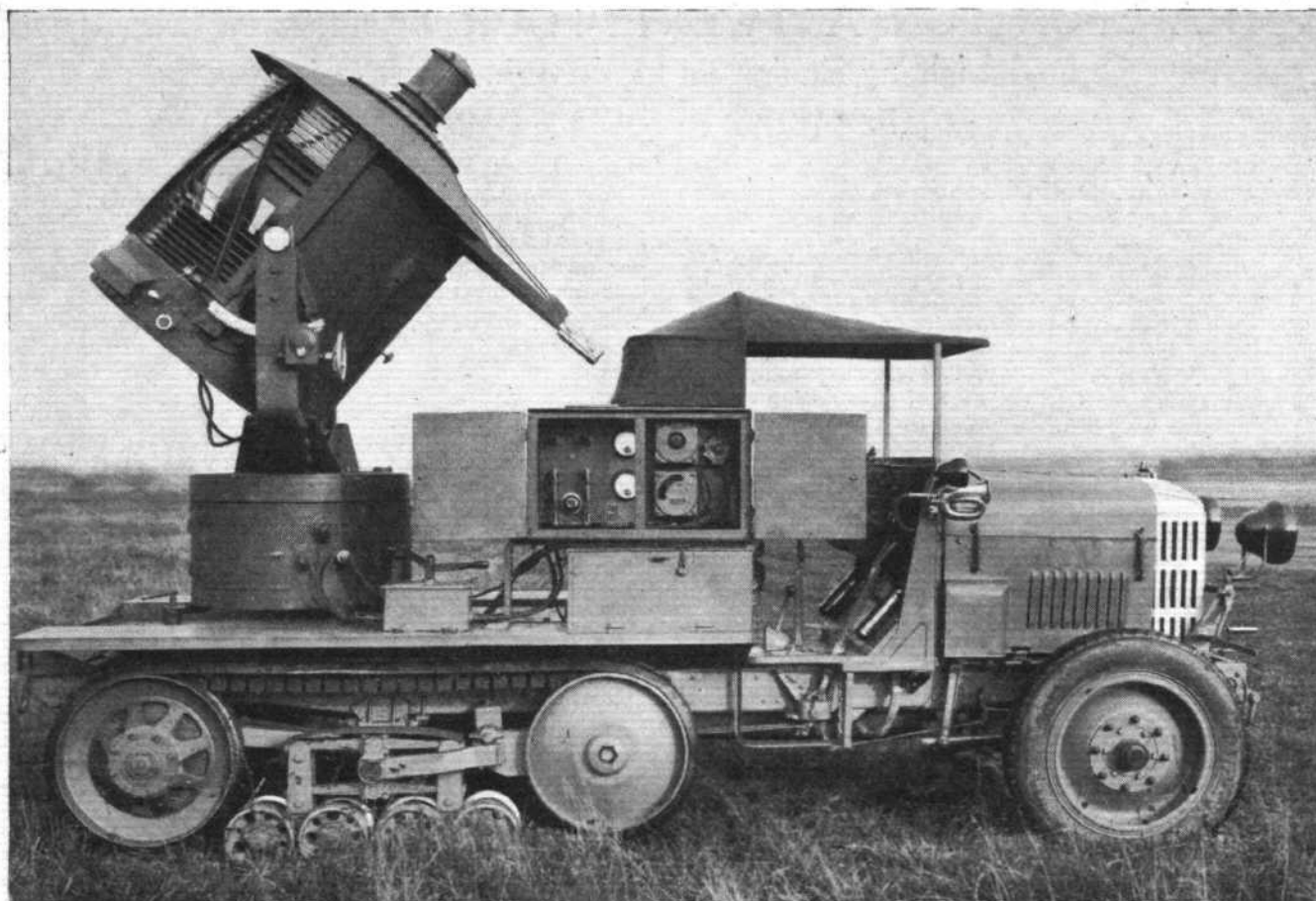
A great deal of experimental work has been carried out during the past ten years, in order to obtain uniform light distribution from the horizontal up to the vertical, and an almost perfect form of lens construction has now been evolved by the lighthouse manufacturers, who were able to base their experiments on marine practice. By an arrangement of glass prisms, it is possible to magnify a source of light many hundreds of times, and it may be as well to consider briefly at this stage the illuminants in use.

Wicks and mantles burning oil and oil gas, respectively used for marine lighthouses since the latter were invented, have been superseded largely by acetylene burners and electric lamps. Acetylene enjoyed the advantage for many years of being the only illuminant for unattended lights, as it could be stored under pressure in a dissolved form, the pressure being utilised to revolve the lens. Gas economy was secured by means of a "light" valve, which turned off the supply, except to the pilot jet, when the light factor was sufficiently high to render signals unnecessary. Electricity now enjoys the same advantage by means of automatic generating sets, with the addition of very much higher candle powers obtained from the concentration of a filament into a small space.

Considering the use of artificial light as an aid to the operation of aircraft by night at a landing ground, the following description from the pilot's seat may assist the reader to visualise the equipment provided. The pilot taxis into position for "taking-off," and receives the "all clear" from the control tower, by means of a portable flashing lamp, which gives out an orange-coloured signal. In the centre of the aerodrome there may be a temporary obstruction, marked by three red flashing lights grouped round it. The boundary is defined by evenly-spaced red flashing lights of a different period to those in the centre marking the obstruction, and the surface of the ground is illuminated by a powerful floodlight, stationed to one side. Knowing the strength and direction of the wind, the pilot opens-up his



AN AIR VIEW OF AN AERODROME AT NIGHT: The illumination is by a 500 mm. Chance floodlight.
(Royal Air Force Official Photograph. Crown copyright.)



A MOBILE FLOODLIGHT UNIT: In the illustration the actual light is tilted upwards for use as a revolving beacon. (Royal Air Force Official Photograph. Crown copyright.)

engine, steers clear of the obstruction in the centre and is 200 feet in the air by the time he passes over the boundary lights. Having attained a reasonable height, he turns to make a circuit and sees below him an enclosed space of illuminated ground, bounded by a hedge of red flashing signals, with permanent obstructions marked by fixed red lights. Taking a bearing from the aerodrome location light, checked by observation of the direction of the wind given by the illuminated indicator in the shape of a "T," he sets his course for the next airport.

The types of lighting apparatus at an airport are as follows:—

1. A location beacon.
2. A floodlight or floodlights.
3. Boundary marking lights.
4. Permanent obstruction lights.
5. An automatic illuminated wind indicator.
6. A signalling lamp.
7. Temporary obstruction lights (kept in store for emergencies).

The location beacon identifies the airport or landing ground from others in the vicinity and should be distinctive in colour apart from its flashing character, so that there is no possibility of mistaking it for anything else. There is no necessity for such a light to be fully automatic, as staff are available for attention and repairs, but it is preferably an electric light, controllable by means of a switch.

The most important light for the purposes of landing and taking-off is the floodlight, which illuminates the surface of the ground and throws into relief the boundaries and the bases of permanent obstructions beyond the operating area, marked at their highest point by fixed red lights. The illumination given by one 500-mm. "Chance" floodlight is nearly 1,000,000 candle-power, sufficient for present-day needs, though higher powers will no doubt be required later when air traffic increases in volume. It is essential for a floodlight to be electric, as no other illuminant will provide this candle-power within the relatively small lens possible

in a mobile unit. The beam of a landing floodlight illuminates a semicircle and is controlled by the lens so that light is projected parallel to the ground.

Boundary lights can be electric or acetylene, the former being more economical to maintain and easier to operate at a uniform flashing period. They are placed at intervals of not more than 100 yards apart and each in such a position that a pilot taking-off or landing over them will clear obstructions on or beyond the boundaries with a margin of safety.

Permanent obstruction lights are fixed red electric lamps placed at the highest points and extremities of permanent obstructions on or around the operating area. Temporary obstruction lights are portable and kept in store for use in case of a crash on the aerodrome, or to mark soft ground in wet weather. They may be acetylene or electric, the former being more economical, owing to larger storage space per unit of weight.

The illuminated wind indicator is perhaps the most interesting light, being a "T"-shaped device about 20 feet long, mounted horizontally on a pylon, so that it is free to rotate, and kept into wind by means of vertical fins. Its upper surface is painted white or chrome yellow and illuminated in outline by means of electric lamps or Neon tubes.

The lighting of air routes and landing grounds is primarily a matter for Governments and Municipalities, which are the owners of the airports and also responsible for the subsidies paid to companies operating aircraft. The latter will become more and more concerned with aerial lighting as their subsidies decrease, because it will be impossible to make air transport pay without night flying. The first stage is undoubtedly to light the airports themselves, enabling pilots to land safely after dark and to take-off before dawn, thus extending the present "daylight" time-tables by two or three hours. The lighting of air-routes and emergency landing grounds in between terminal airports, is the second stage, after which there is no reason why a twenty-four hour service should not be as regular as the present air services by day.

Lord Parmoor visits N.P.L.

LORD PARMOOR, Lord President of the Council, Minister in charge of the Department of Industrial and Scientific Research, paid an official visit of inspection to the National Physical Laboratory, Teddington, on January 9.

Engineering Honour for Sir Richard Glazebrook

THE Council of the Institution of Electrical Engineers have elected Sir Richard Tetley Glazebrook, Chairman of the Aeronautical Research Committee, to be an honorary member of the Institution.

CORRESPONDENCE

[The Editor does not hold himself responsible for opinions expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters intended for insertion in these columns.]

MODELS

[2263] May I offer a most hearty "Hear, hear" to Mr. Neville's suggestion *re* a regular "Models" section in your worthy journal.

Such a section would without a doubt be eagerly welcomed by the members of the Model Aeroplane Societies, and by numerous lone hands like myself. I should like especially technical articles on the designing and construction of modern models. Working to other people's designs is apt to become tame after a time, and one wishes to attempt something original, but do not feel justified in blundering along by mere trial and error and looks.

Scale models, too, should certainly be represented, as this type of work is extremely interesting, and should appeal to all your readers—modellers or otherwise.

Well, fellow modellers—your opinions?

"MODELLER."

York, December 29, 1929

[2264] I have read with interest Mr. Neville's letter in your current issue, in which he advocates space in your paper being given up to model aircraft. I agree.

There must be a number of people who, like myself, have ideas on the future design of aircraft (possibly useless, and certainly crude, through lack of sufficient technical knowledge), and who are quite unable to afford to test these theories otherwise than by the use of models.

Some of these ideas might, for instance, have the essentials of a safety device or genuine improvement, but most, if not all of them, die a natural death through the inability of their inventors to get into the right kind of touch with the aircraft industry; that is to say, to ventilate their ideas without the possibility of their being stolen.

What is wanted is some body of undoubted integrity and secrecy, to whom such ideas could be submitted privately, who, further, would advise the budding inventor regarding the usefulness or otherwise of his schemes, telling him if, when and how to take out legal protection, and giving him information about future procedure.

No doubt your readers are well aware that to incorporate anything new in aircraft is a very expensive proceeding. Not only has the "idea" to be built, but also the plans, specifications, and finished article have to be officially passed at considerable cost. The advice of an efficient body would at least obviate the waste of money.

The devotion of FLIGHT to national airmindedness is well known, and I cannot but feel that your paper could help to form such a body as I have particularised. This body would advise amateur inventors in all matters connected with the bettering of experimental model aircraft, such as they might put forward.

I would, further, with all humility, suggest that a page per issue of FLIGHT be devoted to the design and performance of real flying models.

This would give readers interested in models an opportunity for the ventilating of their ideas in exchange for others.

After all, the serious amateur model aeronautical engineer is almost invariably a man who cannot afford to build or to run actual aeroplanes, but who, from his very keenness, might have ideas which are good, or, more, revolutionary in the science of aeronautics.

If I could, as an enthusiast, be of any use in the forming of such a committee as I have suggested, I would be only too glad to offer my services.

A. DE HAUTEVILLE-BELL.

Rudgwick, Sussex, Dec. 30, 1929.

[2265] Many years ago, as a lad, I wandered into a news-agent's and idly picked up the first number of FLIGHT. I had always been interested in flying ever since Spencer's airship dangled its trail-rope across the roof of my home in North London; but the birth of FLIGHT was the real birth of my enthusiasm, which has never flagged. I started preaching the "Gospel of the Air" then, and I am doing so with equal vim to-day. Within a very short while I was instrumental in getting together a few brother enthusiasts in South London, where I then lived, and with the help of my old friend, Mr. A. B. Clarke, whom you know well, we formed the first model aero club in South London, shortly afterwards amalgamating with the old Aero Models Association. We eventually broke away and formed the Blackheath

Aero Club, which proved under the able guidance of "A.B.C.," very popular, and outstanding in respect to the number of practical members it turned out. Quite a number of us were active also as "pylon" keepers at the old Hendon meetings, and I myself know many of the good old incidents off by heart.

Then the War! The B.A.C., in company with many of the other Model Aero Clubs in the country, gave of its best, and, to my knowledge, many of them were able to make good use of the practical hints picked up during several years' contact with aircraft. After the war the threads were eventually picked up, culminating in the formation of the S.M.A.E. (Society of Model Aero Engineers), brought about by the untiring energy of Mr. A. E. Jones and a few of us old hands. Club and model matters have struggled along since, and are now once more getting established, but it is essential that the movement gets more publicity, and to this end I would welcome the pages of FLIGHT being once more opened to us with regular articles and club reports. I have many times recommended FLIGHT to young people who showed signs of being interested in matters aeronautical, but they lost interest because of the lack of model making matter published. In my humble opinion, this is all wrong, for how else is the future generation going to attain its footing in aviation if the leading publication does not help them? Had we had the same facilities as in pre-war days, model sport and clubs would have, by now, been on a sound footing, but without the help of the Press we cannot make progress. Therefore, I welcome Mr. Neville's letter in your issue of to-day, and join him in asking for all model makers, and especially all club members whether S.M.A.E., H.A.C., T.M.A.C. or other clubs unknown to me, to show their desire for the practical support of "Good Old FLIGHT."

And may I conclude with wishing our old friends "The Editor and FLIGHT" a Happy and Prosperous New Year, and at least a further successful 21 years.

An old and regular reader, CHARLES A. RIPPON
Crouch End, London, N. 8,
December 27, 1929.

THE "RHOMBOIDAL" 'PLANE

[2266.] In your 21st Birthday Number, in which a notice of my "Rhomboidal" 'plane appears, you give my name as "Walton" Edwards, which is incorrect and should be Arthur Henry.

The machine shown in the photo was smashed in taking-off and was not rebuilt, therefore this form of 'plane has had no test in a full-sized machine.

The machine was designed from data obtained from a 4-ft. rubber-driven model which showed great stability in very rough weather.

You gave a description of this model and an account of a flight made by same in your issue of February 5, 1910.

A. H. EDWARDS.

[Mr. Edwards omitted to include his address with this letter. Would he kindly furnish us with this—and perhaps he could also tell us something more about his experiments with the "Rhomboidal" 'plane? We understood that the machine, when it was down at Brooklands in 1911, was known as the "Walton-Edwards."—ED.]

A BIRTHDAY GREETING

From Dr. Claudius Dornier, the famous German aircraft designer and constructor, we have received the following birthday message, Herr Dornier explaining first that he is but recently returned from a trip to the United States, and has not, therefore, been able, as he desired to do, to send us his greetings in time to be included in the Special Birthday Number of FLIGHT:—

[2267] "Ich lese seit langen Jahren Ihre Zeitschrift persönlich und habe eine Fülle wertvollster Informationen in derselben gefunden. Ich glaube, dass man Sie aufrichtig beglückwünschen kann für den Erfolg, welchen Sie innerhalb mehr als zwanzig Jahren gehabt haben und ich möchte nicht verfehlen, Ihnen auch persönlich zu gratulieren."

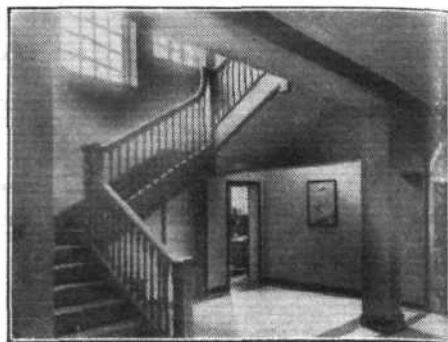
Translation.—I have personally read your journal for many years, and have found in it a wealth of the most valuable information. I believe that one can sincerely congratulate you on the success which you have had for more than twenty years, and I should not fail to congratulate you personally.

(Signed) C. DORNIER

Friedrichshafen, January 8, 1930.

“DOPE”

(Illustrating the new works of
Cellon, Ltd., Kingston.)



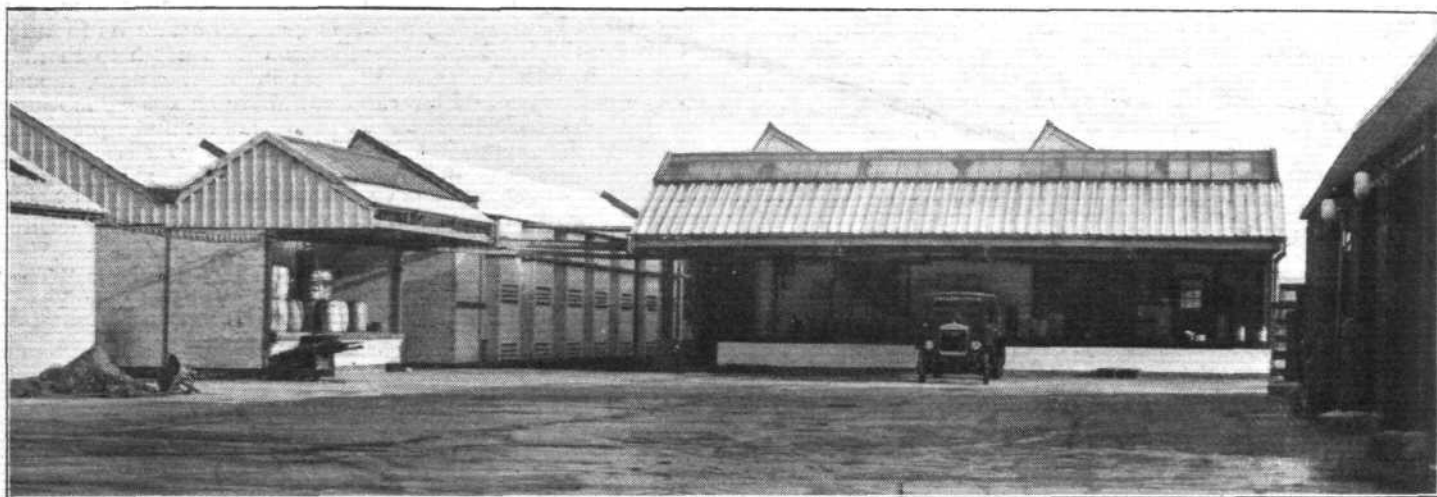
A corner of the new offices at Kingston. (FLIGHT Photo.)

DOPE as a commercial article for use on aeroplane wings was first extensively used in this country about the year 1910; previous to this solutions of starch had been used in an endeavour to tauten the fabric on the wings, and this was considered a reasonable medium until the discovery was made that solutions of cellulose esters had the property of drawing the fabric taut as they dried out.

Numerous changes have taken place in the technique of the

turing processes, so that the product as used today is not only safe to use, but its purity is thereby absolutely guaranteed.

Dope is a solution of cellulose esters in various solvents and diluents; these latter are used to increase the solvent power of the solvents, although they themselves would have little solvent properties if used alone, and also they have the great advantage that they are much cheaper than the



This shows the open layout of the Cella Works, which allows lorries to handle the incoming and outgoing material without congestion. (FLIGHT Photo.)

manufacture of dope since the early days and a great deal of work has been done at Farnborough in this direction. One of the earliest solvents to be generally used was called, "Tetrachlorethane," but this had poisonous properties and consequently the Home Office instituted enquiries which have resulted in a very strict watch being kept on the manufac-

solvents. Two main forms of Dope are marketed today, and these are the cellulose nitrate and cellulose acetate. In the former case the cellulose is nitrated with a mixture of nitric and sulphuric acids, while in the latter it is acetylated with acetic anhydride. The chief solvents used are acetone, methyl ethyl ketone, and amyl or butyl acetate, and these are mixed with such diluents as benzol, toluol, xylol, and alcohol. A further ingredient, which has to be used is a plasticiser, such as triphenylphosphate or castor oil, this is necessary, as if only the solvents and diluents were used, the resulting dope would tauten the fabric too much, and also be too hard and crack off; the plasticiser is therefore a softening agent, and as such must be a solvent for the cellulose ester, and must only evaporate slowly if at all.

A feature of dope is that once the film has been formed on a wing by complete evaporation no further physical or chemical change takes place in it, whereas with paints and varnishes of an oil base oxidation is continually going on with a consequent deterioration of the surface.

At the works of the Cellon Company the cellulose acetate dope is the one specialised in, as it is claimed that this is cheaper than the nitrate dope, because a smaller quantity of it has the same tautening effect. The new Kingston Works shown in our photographs have just recently been opened in order to cope with the increased trade which has sprung up, due to the adaptation of "dope" to so many other purposes such as car finishes; decorating numerous kinds of



The artistically designed office buildings at Kingston. (FLIGHT Photo.)



The mixing room at Kingston. The mixing tanks are seen in the gallery, and some drums are "dancing" on the overhead run, which allows transport to any part of the works. (FLIGHT Photo.)

small articles; decorating houses—the walls and ceilings of the new offices are all done in "Cellon"—for which purpose it forms an extremely durable surface which can be washed and even knocked about without sustaining damage, any purpose for which paint was used in inside work can now be done with a brushing or spraying cellulose lacquer; fabric bodies on cars and much imitation leather is surfaced with cellulose lacquer; a washable and imperishable form of wall paper is now made with a surface of cellulose, and, in fact, there are so many applications of it that one could fill a whole article on that one point alone. The works have been most carefully laid with a view to saving labour, and to ensuring that the quality of the product shall be of the very highest.

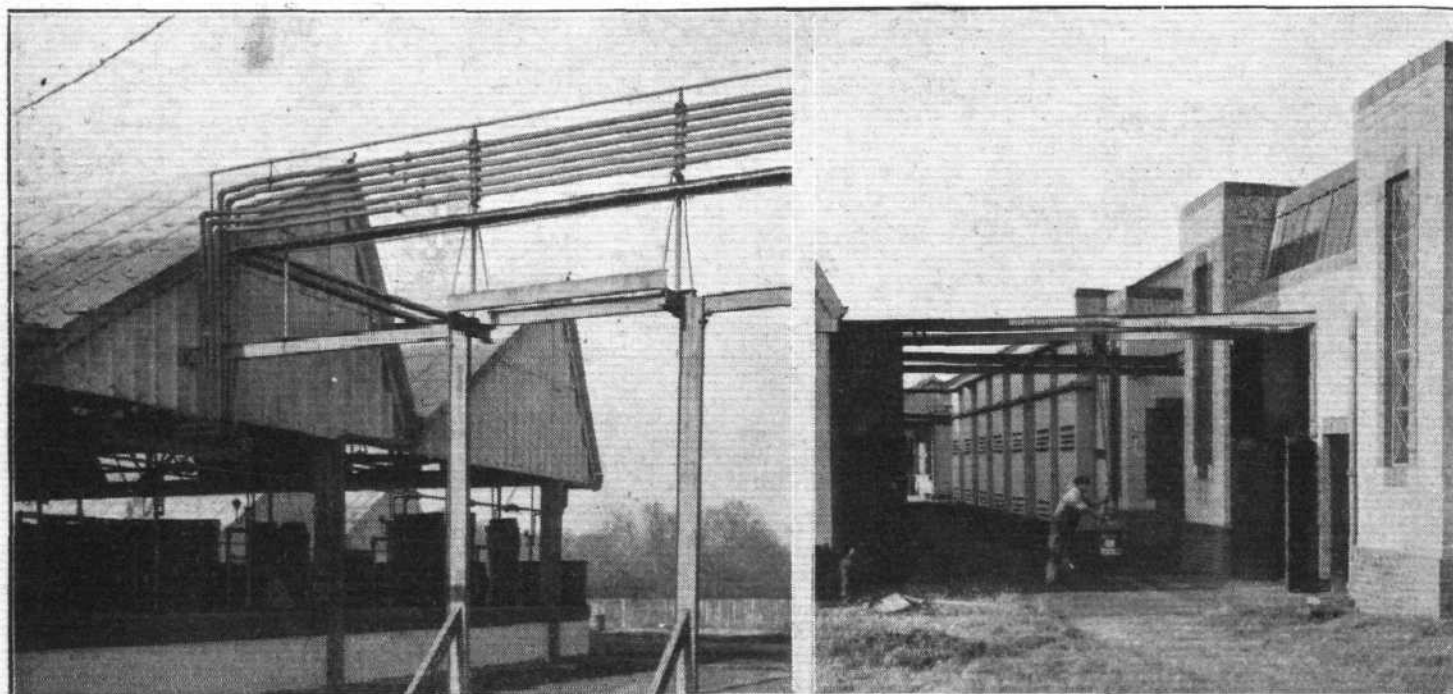


Where the pigments are ground. (FLIGHT Photo.)

The solvents are all kept in underground tanks in the solvent store, and are transmitted to the mixing room by pipe lines along which they are blown by compressed air. In the mixing room are large 500 gall. mixing tanks for aeroplane dope, and the basic mixtures which are pigmented later as coloured lacquers in smaller tanks. Above the tanks at a central position is a visible measure into which the foreman can let the requisite amount of the various solvents be forced, and this can then be run into whichever tank it is wished to use, by gravity. He runs the specified amount of solvents into the tank, and then the cellulose and solids are put in through the lid, after being weighed. Inside the tanks is a form of propeller, mechanically driven by shafting, which is run for a number of hours to effect the mixing. Pigments are first ground in either castor oil or benzyl alcohol before being weighed up and put in the tank.

The contents of the mixing tanks are tested from time to time by viscometer, and when of the correct viscosity and correctly mixed they are drawn from the mixing drums into, in the case of the 500-gall. tank, 10 gall. measures, and from the smaller drums they are checked by weight. Throughout the whole process of manufacture the greatest care has to be taken to test everything at every stage, and samples are taken not only of all raw material, but at every stage of manufacture before the next stage is started. A well-equipped laboratory and a technical staff of chemists is employed to look after this most important side of the business, and a system is in force whereby every batch of material and every tank full of dope has to have its history sheet, and this sheet is signed by the various authorities before it is allowed to go to the next stage. This is vitally important, as even very small quantities of impurities can have a very deleterious effect upon the finished product. For instance, there is a case upon record when the normal procedure was adhered to throughout in the manufacture of a batch of dope, but when tested it was found to be too thick, and, moreover, became thicker; after cleaning out the mixing tank very minute traces of copper from the bearings of the mixing propeller were found, and these were the sole cause of the trouble!

The finished dope is also tested for its tautening properties by applying it to test frames; the method generally used for



A corner of the Solvent store showing the pipe lines to the mixing shop.

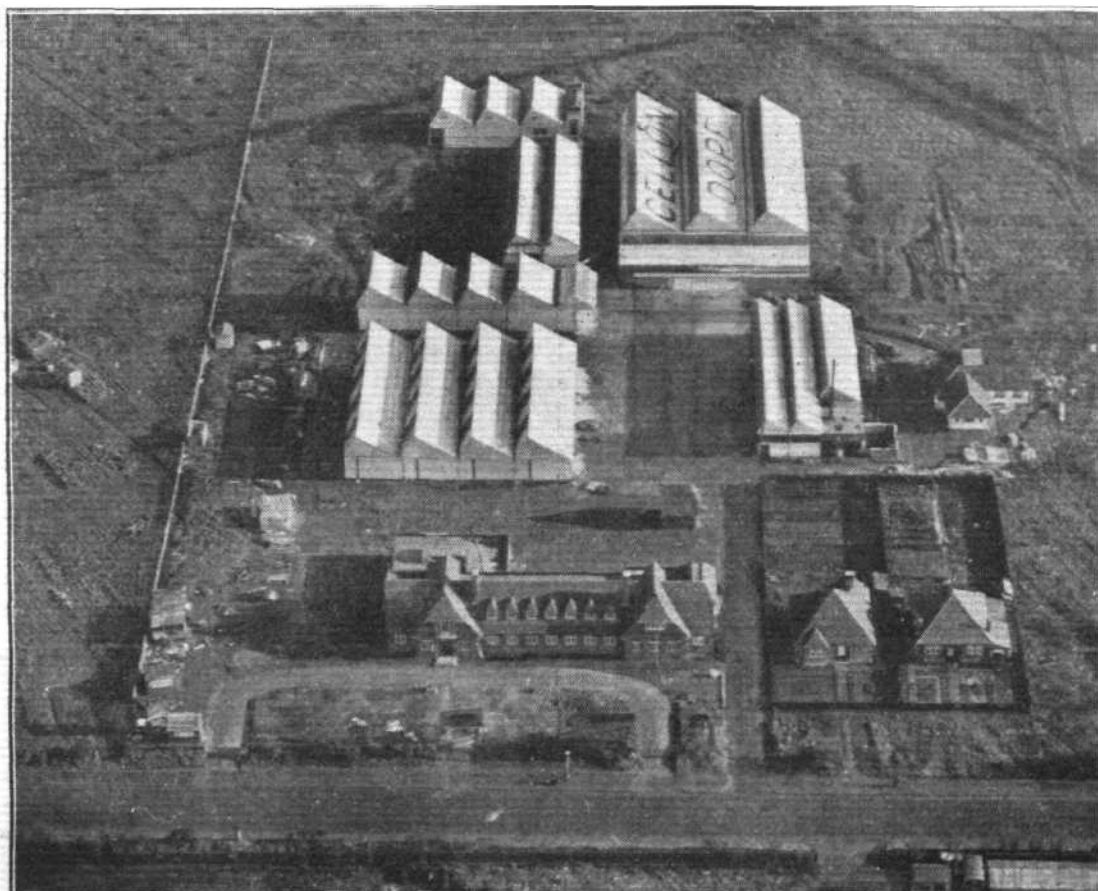
How the overhead runways connect up the different shops. (FLIGHT Photos.)

this is to apply a known pressure to the centre of the doped fabric on the frame and to measure the depression caused.

Another kind of test which is of extreme importance is that for colour and smoothness of the pigments after grinding; this is done in the laboratory and checked against a set of standards. The colour of the pigmented cellulose lacquers is also, of course, matched many times before being finally passed, and a record is kept of every batch of material sent out, so that there is no difficulty in fulfilling repeat orders.

Among the other things now being produced at Kingston are lacquers for producing a whole range of special finishes for decorative purposes. There are too many to mention all of them, but among the more interesting are the "crackle" finish; this is obtained by putting on a normal undercoat of either a light or dark lacquer, light is mostly used, and when

this is dry a coat of special very quick-drying lacquer of a contrasting colour is sprayed over it, which dries so quickly that it contracts, and in doing so leaves cracks through which the colour of the undercoat may be seen. The size and number of the cracks can be largely controlled, by a skilled workman, by the thickness of the crackle coat; a thin coat means large cracks, and vice versa. Then a very ornamental finish called the marbled finish can be obtained by using special lacquers of different colours sprayed upon each other and made to run into each other by spraying the surface with a certain amount of solvent. Another product which Cellon have put on the market is Cellabrase and Cerrax polish; these have been produced in response to a demand for a polish suitable for use on car bodies which were finished in cellulose. The Cellabrase is an abrasive polish which is



The Cellon Works at Kingston from above.

designed to be used when the surface is very bad, and Cerrax is an admixture of waxes with which a high polish can very easily be obtained and which at the same time feeds instead of, in any way, destroying the surface of the lacquer.

A further adaptation of cellulose lacquer is for furniture polishing. Any known finish, such as french polish, dark or light oak or satin-wood, can be obtained, and the finished article when done in this fashion will have a durable surface which will not finger-mark nor show the marks of hot plates or damp.

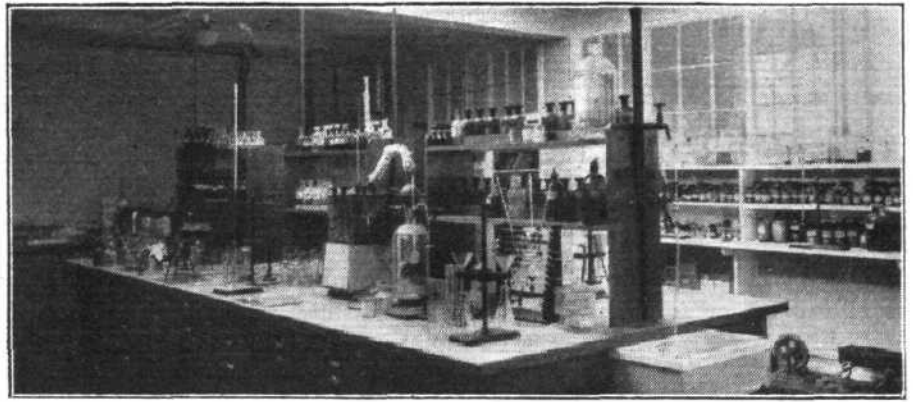
For those who are chemically minded the following are two imaginary specifications for dopes; these merely serve to show the type of ingredients, and would in actuality be varied according to the use for which they were required:—

(1) Cellulose acetate, with methyl-ethyl-ketone and acetone as the solvents, benzol and alcohol as the diluents, and triphenylphosphate as the plasticiser; the pigment may have been ground in benzyl-alcohol.

(2) Nitro-cellulose, with amyl acetate, butyl acetate and acetone as solvents, benzol, alcohol, toluol as diluents, and castor oil in the pigment as a plasticiser.

For lacquers which are to be sprayed upon comparatively smooth metal surfaces a further ingredient in the shape of a suitable gum dissolved in certain solvents and diluents would be required, in order to obtain adhesion to the surface.

Further evidence of the foresight with which the factory has been laid out is to be seen in the fact that a system of overhead runways has been incorporated so that drums can



A corner of the laboratory. (FLIGHT Photo.)

be picked up by travelling pulley-blocks and pushed to any other part of the factory. There is also a well-equipped workshop, and all the repair work and the alterations are done by their own engineers.

Ventilation is a point which calls for the greatest care, and the various shops are all carefully ventilated and heated by a circulatory system which makes use of ducts in the walls.

Finally, the social welfare of the employees has not been overlooked, and a comfortable canteen has been laid out with a rest room. Mr. Wallace Barr, the managing director, who is well known as one of the pioneers in the aviation business, has always shown that he has the welfare of his employees very much at heart, and there can be few factories where they are better cared for.

THE ROYAL AIR FORCE

London Gazette, January 7, 1930.

General Duties Branch

The follg. Pilot Officers on probation are confirmed in rank:—J. S. Tanner (December 13, 1929); F. E. Abbott, J. A. Brown, C. R. Crow, J. S. Douglas, E. Esmonde, J. W. C. Glen, D. B. Knapp, H. V. L'Amey, A. E. V. Mathias, G. B. Musson, A. T. Orchard, T. J. Rees, E. G. Sharp, J. A. Simpson, G. R. Warner (December 28, 1929).

The follg. are promoted with effect from January 8:—Flight-Lieutenants to be Squadron Leaders.—E. D. Davis, R. S. Sorley, D.S.O., D.F.C., M. Moore, O.B.E., H. G. Crowe, M.C., H. P. Lloyd, M.C., D.F.C., F. P. Adams, F. M. F. West, V.C., M.C., T. S. Ivens, C. T. Anderson, D.F.C., C. A. Stevens, M.C.

Flying Officers to be Flight Lieutenants.—E. V. S. Lacey, H. N. Hawker, G. C. Stemp (Lieut.), The Buffs, R.A.R.O., G. D. Harvey, J. F. F. Pain, G. R. Beamish, J. H. Hutchinson, A. P. K. Hattersley, C. W. Croxford, D.S.C. (Hon. Flight Lieut.), H. H. Brookes, R. H. Barlow, R. Melbourne, S. H. V. Harris, P. R. Gardner, Earl of Bandon; J. G. Franks, A. C. H. Sharp, G. N. J. Stanley-Turner, J. Warburton.

The follg. Pilot Officers are promoted to rank of Flying Officer:—F. A. R. Bishop (October 8, 1929); C. V. Howes, P. K. Robertson, P. J. Connolly (November 25, 1929). Sqdn.-Ldr. J. H. O. Jones ceases to be seconded for duty with the British Advisory Staff in Chile (December 22, 1929). The follg. Lieuts., R.N., are re-attached to R.A.F. as Flying Officers with seniority of June 16, 1924, and with effect from dates indicated:—S. T. Morgan (December 26, 1929); J. I. Robertson (December 27, 1929).

Pilot Officer on probation S. R. Hall resigns his short service commn. (December 24, 1929). The follg. relinquish their short service commns. on account of ill-health:—Flying Officer W. A. Shorten (January 6); Pilot Officer on probation J. D. Roden (January 8).

The following Flying Officers are transferred to Reserve (January 6):—Class A.—W. F. Bryanton, P. B. Chubb, E. J. Ellis, F. S. Homersham, D.C.M., M.M., B. E. Moody, A. C. Watkins. Class C.—L. B. McGovern, V. J. Sofiano.

The short service commns. of the undermentioned Pilot Officers on probation are terminated on cessation of duty:—M. A. Murtagh (December 31, 1929); A. M. Wood (January 5).

Medical Branch

Flight-Lieut. M. O'Regan is transferred to Reserve, Class D (ii) (January 4).

RESERVE OF AIR FORCE OFFICERS

General Duties Branch

The follg. Pilot Officers are promoted to rank of Flying Officer:—L. F. Hooper, P. L. D. Teichman-Derville (December 25, 1929); J. G. Naz, E. W. Seymour-Hosley (December 29, 1929). Flight-Lieut. P. Stainer is transferred from Class A to Class C (November 10, 1929); Flying-Officer E. J. Dillnutt is transferred from Class B to Class C (June 2, 1929). The follg. are transferred from Class AA (ii) to Class C:—Flying Officer E. P. Swallow (December 28, 1929); Pilot Officer J. L. Browne (September 17, 1929).

The follg. relinquish their commns. on completion of service:—Flying-Officer E. Marler (December 29, 1929); Pilot Officer H. W. P. Stewart (December 23, 1929). Flying-Officer W. McGowan relinquishes his commn. on completion of service and is permitted to retain his rank (December 21, 1929).

AUXILIARY AIR FORCE

General Duties Branch

No. 605 (COUNTY OF WARWICK) (BOMBER) SQUADRON.—The follg. Pilot Officer to be Flying Officer:—J. R. H. Baker (December 14, 1929).

The engagement is announced between ALFRED WILLIAM HUNT, R.A.F. only son of Mr. A. J. Hunt and the late Mrs. Hunt, of Melbourne, Australia and MARY ISOBEL, daughter of Mr. and Mrs. F. E. Tubbs, of 4, Westwood-road, Southampton.

THE ROYAL AIR FORCE

PERSONALS

Married

MR. GEOFFREY MUNGO BUXTON, R.A.F., eldest son of the late Commander Bernard Buxton, D.S.O., R.N., and the late Lady Buxton, was married on December 21 at the church of St. Martin-in-the-Fields, Trafalgar Square, to Miss HORATIA MARY FISHER, younger daughter of Vice-Admiral Sir William Fisher, K.C.B., C.V.O., and Lady Fisher.

The marriage took place on January 8, at St. Paul's Church, Sandgate, Kent, of Flying Officer CHARLES WILLIAM GORE, R.A.F., son of Lt.-Col. C. W. Gore (late Duke of Wellington's Regt.) and Mrs. Gore, of 30, Marlborough-road, Ponnybrook, Dublin, and Miss FRANCES CATHERINE CHAMBERS, eldest daughter of Major O. A. Chambers (late R. Warwickshire Regt.) and Mrs. Chambers, of Manor House, Sandgate, Kent.

On December 28, 1929, at St. Barnabas', Tunbridge Wells, RAYMOND HENRY ROBERTS HAYNE, The Royal Sussex Regt., only son of H. Bertram R. Hayne, of 15, Calverley Park, Tunbridge Wells, was married to RACHEL MARY, only daughter of Mr. and Mrs. CLEMENT SIMPSON, of 39, Woodbury Park Road, Tunbridge Wells.

Squadron-Leader J. A. SADLER, R.A.F., son of Mr. Geoffrey C. Sadler, of Abbots Langley, Hertfordshire, was married on January 4, at All Souls' Church, Langham Place, to Miss REBECCA MANNERS, daughter of Mrs. T. N. Manners, of Penzance. Flight-Lieut. F. A. Norton, R.A.F., was best man.

To be Married

The marriage arranged between Flight-Lieut. B. W. T. HARE, R.A.F., of Curtisknowle, South Devon, and Miss VIOLET FISHER, of 40, Bramham Gardens, S.W.5, will take place in India in February.

The Royal Air Force Memorial Fund

THE usual meeting of the grants sub-committee of the fund was held at Iddesleigh House, on December 19. Mr. Walter S. Field was in the chair and the other members of the committee present were: Mrs. L. M. K. Pratt-Barlow, O.B.E., Squadron Leader A. H. Wann. The committee considered in all 14 cases, and made grants to the amount of £352 19s. 2d.

R.A.F. Hockey

SIXTEEN entries in the Open event and 20 in the Junior have been received for the Royal Air Force tournaments, which will be played during the early months of 1930. In each case the finals must be played off by April 2. The draw is:—

Open Tournament.—First Round: Halton v. Cranwell; Shrewsbury v. Upper Heyford; Digby v. Henlow; Grantham v. Sealand; Gosport v. Uxbridge; Eastchurch v. Manston; Andover v. Calshot; Farnborough v. Netheravon.

Junior Tournament.—Byes: Lee-on-Solent, Bicester, Upavon, Worthydown, Old Sarum, and Upper Heyford. First Round: Tangmere v. Andover; Kenley v. Farnborough; Martlesham Heath v. Ruislip; Eastchurch "H" (33 Squadron) v. Hornchurch. Byes: Duxford, Felixstowe, North Weald, Stanmore, Wittering, and Northolt.

AIR MINISTRY NOTICES TO AIRMEN

Jersey and Guernsey : Air Navigation (Amendment) Orders

1. ORDERS in Council have been established applying to the Air Navigation (Jersey) Order, 1928, and the Air Navigation (Guernsey) Order, 1928, the provisions, with certain exceptions, modifications and adaptations, of the Air Navigation (Amendment) Order, 1927, the Air Navigation (Amendment) Order, 1928, the Air Navigation (Amendment) (No. 2) Order, 1928, the Air Navigation (Amendment) (No. 3) Order, 1928, and the Air Navigation (Amendment) (No. 4) Order, 1928.

2. Copies of the new Orders, which are entitled the Air Navigation (Amendment) (Jersey) Order, 1929 (S.R. & O. 1929, No. 1020) and the Air Navigation (Amendment) (Guernsey) Order, 1929 (S.R. & O. 1929, No. 1019), may be obtained direct from H.M. Stationery Office, or through any bookseller, price 2d. and 3d., respectively. (No. 73 of 1929.)

Air Navigation Directions, 1929 (A.N.D.7b)

1. Attention is drawn to the publication of the Air Navigation Directions, 1929 (A.N.D. 7b), copies of which are obtainable direct from H.M. Stationery Office, or through any bookseller, price 1d. net.

2. The new Directions further amend the Air Navigation Directions, 1928 (A.N.D.7) as amended by the Air Navigation Directions, 1929 (A.N.D. 7a), the principal matters affected being as follow :—

- (i) Special provisions as to experimental or test flights, etc.
- (ii) Regulations regarding the carriage of radio-electric apparatus on board civil aircraft carrying passengers for hire or reward.
- (iii) Regulations regarding the carriage of navigators on civil aircraft carrying passengers for hire or reward and the requirements as to the examination and licensing of such navigators. (No. 77 of 1929.)

NOTICES TO AIRCRAFT OWNERS AND GROUND ENGINEERS

Provision of Fireproof Bulkheads : Temporary relaxation of Airworthiness Requirements for Certain Aircraft

1. It has been decided that aircraft fitted with rotary engines which are not provided with a fireproof bulkhead to insulate the engine from the rest of the aircraft may, notwithstanding the requirements specified in Leaflet D. 2 of the Airworthiness Handbook for Civil Aircraft (A. P. 1208), be granted a certificate of airworthiness, if the aircraft otherwise complies with airworthiness requirements, and is recommended for the issue of a certificate of airworthiness within six months from the date of this notification.

2. Similarly, aircraft of this description in respect of which certificates of airworthiness have been or shall have been issued, but which do not conform to airworthiness requirements in this respect, may, if the other requirements of airworthiness are met, be granted renewals of such certificates of airworthiness at any time up to two years from the date of this notification.

3. In each of the above cases the requirement in question will be rigidly enforced after the expiration of the period indicated.

NOTE.—In order to draw the special attention of aircraft owners to the information contained in the Notices hitherto known as "Notices to Ground Engineers," this series of Notices will, in future, be entitled "Notices to Aircraft Owners and Ground Engineers." (No. 26 of 1929.)

Top Front Spar Outer Joint on "Moth Aircraft" with Slotted Wings (D.H.60.X., G., and N.).

1. On aircraft of the above types the inner $\frac{1}{8}$ in. B.S.F. bolt at the top front spar outer joint should be replaced by a $\frac{1}{4}$ in. B.S.F. bolt, in accordance with Drawing No. N.1193, copies of which may be obtained from Messrs. De Havilland Aircraft Co., Ltd., Stag Lane Aerodrome, Edgware, Middlesex.

2. Certificates of Airworthiness for this type will not be renewed unless this modification has been incorporated. (No. 27 of 1929.)

Manufacture and Inspection of Aircraft Parts to Drawings

(1) The attention of aircraft owners and ground engineers is drawn to the fact that cases have occurred where defective parts have been replaced by parts manufactured without reference to drawings, the defective part being used as a pattern.

(2) It is pointed out that in such circumstances there is considerable risk of the new part being made of incorrect materials and/or to incorrect dimensions.

(3) In every case where it is necessary to manufacture any detail or component of an aircraft for which a Certificate of Airworthiness has been issued or is to be issued or renewed, such replacements must be manufactured and inspected to approved drawings.

(4) Certification of any repair affecting the safety of an aircraft under paragraph 57, sub-section 2, of the Air Navigation Directions, 1928 (A.N.D.7) should not be made unless either :—

- (a) The replacement part has been approved by the makers of the aircraft ;
- (b) The part has been manufactured and inspected to standard approved drawings (approved repair schemes issued by certain makers coming under this head) ; or
- (c) The repair has been approved as a "modification subsequent to the issue of a Certificate of Airworthiness" under the procedure described in paragraph 35 of A.N.D. 7. (No. 1 of 1930.)



THE MODEL AIRCRAFT CLUB (T.M.A.C.)

PROGRESS of this Club since the "Model Engineer Exhibition" has been excellent, thanks to the enthusiasm and support of the members. Outdoor flying has been continuous, especially on Wimbledon Common, Parliament Hill Fields, Victoria Park, Blackheath, and Brighton. Reports from the Provinces are coming in rather slowly, but, of course, Headquarters realise the difficulties that Provincial members have to put up with.

Just to encourage the Provincial members, will they please take note that some of the London members who possess motor-cars are going to help to form a party of motorists who will take down to the Provinces members of the London Sections to give flying demonstrations. Will the London members who are willing to support this movement have a model aeroplane always ready and in good trim for that purpose. Provincial clubs can support this enthusiastic movement by getting their local members to welcome the visitors by having their models ready.

The Competition Secretary, Mr. T. Newell, has prepared the Competition Rules of the T.M.A.C. They are only waiting to be approved by the Council, who will hold a meeting at an early date.

Our Publicity Officer, Mr. W. E. Trevithick, of 109, Kingsway, W.C.2, wants more articles from the members appertaining to model aeronautics for publication.

Our Sectional Secretary, Mr. J. J. Holt, is very anxious to get busy with his duties in reference to the formation of sections of the T.M.A.C.

Mr. T. Newell will be pleased to receive suggestions in reference to rules, etc., for competitions.

Those members who have not already forwarded voluntary subscriptions will be hearing from our Financial Secretary, Mr. M. Gibson, at an early date.

All communications should be forwarded for the time being to the Hon. Secretary, Mr. A. E. Jones, of 48, Narcissus Road, West Hampstead, London, N.W. 6. Phone: Hampstead 8363.

IMPORTS AND EXPORTS

AEROPLANES, airships, balloons and parts thereof (not shown separately before 1910.)

For 1910 and 1911 figures see FLIGHT for January 25, 1912.

For 1912 and 1913, see FLIGHT for January 17, 1914.

For 1914, see FLIGHT for January 15, 1915, and so on yearly, the figures for 1927 being given in FLIGHT, January 19, 1928.

	Imports.		Exports.		Re-exports.	
	1928.	1929.	1928.	1929.	1928.	1929.
Jan.	1,220	2,852	157,598	74,307	330	100
Feb.	1,772	6,532	118,622	195,369	345	2
March	4,805	1,210	125,901	204,664	1,307	902
April	2,904	5,816	134,126	186,477	3	115
May	2,513	4,706	118,804	243,549	640	1,243
June	5,916	9,304	86,245	144,817	1,317	750
July	2,025	6,961	108,746	139,695	521	—
August	2,566	16,706	97,303	160,625	100	4
Sept.	4,240	510	72,475	237,303	3,183	9,686
Oct.	6,098	6,226	77,027	297,879	315	1,370
Nov.	3,825	5,993	115,219	117,858	1,615	24,063
Dec.	4,894	2,649	122,510	163,02	520	819
	41,196	69,465	1,328,936	2,165,545	10,196	*38,244

* This total as given is in accordance with the Governmental Trade accounts, although this total does not agree, as will be seen, with the Government items as given each month.



NEW COMPANIES REGISTERED

WOLVERHAMPTON AIRCRAFT CO., LTD., Waterloo House, 20, Waterloo Street, Birmingham.—Capital £1,000, in £1 shares. Manufacturers of and dealers in airships, aeroplanes, balloons, hydroplanes, motor cars, etc. Directors: J. Whitehill, "Bridgeside," Solihull, Warwickshire; C. Wrighton, "Kerrisdale," Granville Road, Dorridge, Warwickshire.

WOLVERHAMPTON AVIATION CO., LTD., Oxley Garage, Stafford Road, Wolverhampton.—Capital £500, in £1 shares. Manufacturers of and dealers in airships, aeroplanes, balloons, hydroplanes, motor cars, etc. Directors: J. R. Whitehill, "Bella Vista," Stafford Road, Wolverhampton, motor engineer; S. Summerfield, Twyford, Melton Mowbray, Leics., air pilot.

W. Z., LTD., 4 and 6, Throgmorton Avenue, E.C.2.—Capital £1,000, in £1 shares. Manufacturers of and dealers in aeroplanes, hydroplanes, airships, balloons, and aircraft of all kinds, etc. Directors: Sir Robert C. Witt, C.B.E., 32, Portman Square, W.1, solicitor (chairman); W. Zietz, 120, Rue de Lausanne, Geneva; L. de Lorient, Cologny, Geneva, chemical manufacturer.

AERODROME CONSTRUCTIONS, LTD., 39, Victoria Street, S.W.1.—Capital £2,000, in £1 shares. Under agreement with Air Commodore Duncan le Geyt Pitcher, C.M.G., D.S.O., to develop and turn to account the agencies comprised therein, to construct and control aerodromes and landing places and grounds for aircraft hangars, sheds, garages, etc. Directors: Air Commodore D. Le Geyt Pitcher, 10, Union Mansions, Queen's Club Gardens, W.14; Lieut.-Col. J. Gourlie, Army and Navy Club, Pall Mall, S.W. Secretary: J. Gourlie.



AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motor. (The numbers in brackets are those under which the Specifications will be printed and abridged, etc.)

APPLIED FOR IN 1928

Published January 16, 1930

- 27,030. DORNIER-METALLBAUTEN GES. Control apparatus for aircraft. (306,074.)
- 30,090. F. W. B. HAMBLING. Aircraft. (323,069.)
- 35,868. J. GERIN. Aeroplanes having a variable lifting surface. (302,277.)

APPLIED FOR IN 1929

Published January 16, 1930

- 2,928. C. ARNOLD. Toy aeroplane. (323,139.)

FLIGHT, The Aircraft Engineer and Airships

36, GREAT QUEEN STREET, KINGSWAY, W.C.2
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